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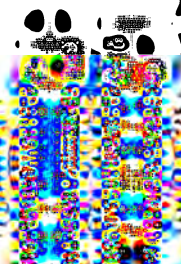
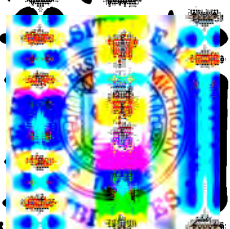
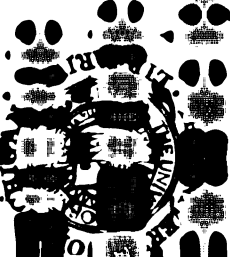
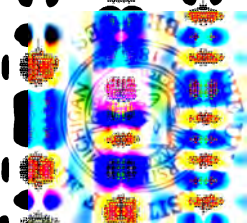
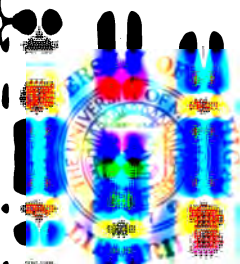




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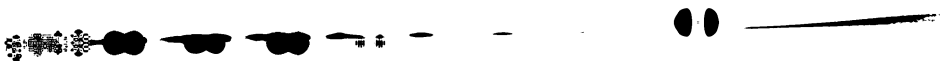
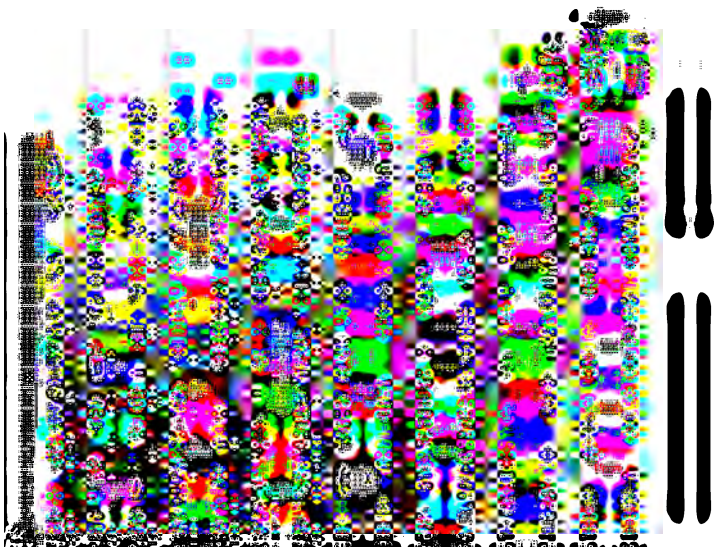
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RESOLUTIONS

RESOLUTIONS

at
March 5, 1897
at

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for and
MEXICO



Given in and before
the
NOTARY PUBLIC

of the State of

written by Charles E.

to Park Commission, February 15, 1897

to the said Commission

of the said County

with the said

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PREFACE.

This paper on the Metropolitan Reservations was the last report written by Charles Eliot. The original manuscript, with its maps and numerous photographic illustrations, is at once a record of the condition of the reservations in 1896 as regards their vegetation, and a treatise on the methods of controlling and changing the vegetation in the interest of the scenery. As a record it is not possible to reproduce it in printed form, but as a treatise it can be adequately, though not completely, presented in print, and as such it deserves wide reading, for the principles set forth have wide application.

This pamphlet has been published with the approval of the Metropolitan Park Commission, and the expense of publication has been met by one of the Commissioners.

F. L. & J. C. OLMSTED,
Landscape Architects.

BROOKLINE, MASS.,

18th November, 1897.

Letter of Transmissal.

BROOKLINE, 15th February, 1897.

W. B. DE LAS CASAS, Esq.,

Chairman of the Metropolitan Park Commission.

DEAR SIR:

We hand you herewith the field notes and maps* of the forest surveys referred to in our last annual report, — the product of studies begun soon after the taking of the several reservations, and continued as opportunities have offered from time to time; also a list of the trees and shrubs of the reservations, with notes on their habits and distribution (41 typewritten pages). Messrs. Warren H. Manning, Percival Gallagher, J. Fred Dawson, Arthur A. Shurtleff, and Charles H. Wheeler have done most of this mapping and note-taking as our assistants.

A summary report of the principal ascertained facts, with photographic illustrations,† is also submitted herewith, including some account of the origin of the commoner types of woodland scenery, and some suggestions as to that control of the vegetation of the reservations which will be necessary for the preservation and enhancement of the beauty and interest of the landscape.

Respectfully submitted,

OLMSTED, OLMSTED & ELIOT.

*Tinted nigrosine prints of the topographical maps, on the scale of 100 feet to 1 inch, of Blue Hills Reservation (33 sheets), Middlesex Fells Reservation (24 sheets), and Stony Brook Reservation (8 sheets), with typewritten notes on the vegetation attached to each.

† Nearly all of the 154 photographs were taken by Mr. N. L. Stebbins.

Vegetation and Scenery in the Metropolitan Reservations.

THE OBJECT OF THE INVESTIGATION.

The purpose of investing public money in the purchase of the several metropolitan reservations was to secure for the enjoyment of present and future generations such interesting and beautiful scenery as the lands acquired can supply; at all events, it is on the assumption that this was the purpose in view that the following report, with the investigation it describes, is based.

The scenery of the inland reservations may be considered as compounded of the varying forms of the ground, rocks, waters, and vegetation, and of a great variety of distant prospects, including views of the sea, and of remote mountains, such as Wachusett and Monadnock. The more or less rock-ribbed masses of the Fells and the Blue Hills, and the intricately carved or modelled hollows of Hemlock Gorge, Stony Brook, and Beaver Brook reservations have life-histories of their own; but the processes of their evolution are so slow, that for all human purposes these smooth, rough, concave, or convex surfaces may be regarded as changeless. It is, moreover, quite unlikely that there will ever be any need of artificially modifying them in any considerable degree. Such paths or roads as will be needed to make the scenery accessible will be mere slender threads of graded surface winding over and among the huge natural forms of the ground. As to the waters of the reservations, they may, indeed, be artificially ponded here and there, as they have already been in the Fells and in Lynn Woods, where the reservoirs greatly enliven the general landscape; but the numerous minor brooks and rivulets will doubtless continue to dry up and rise in flood alternately, as is their habit in our climate, without affecting more than the local scenery of the hollows or ravines in which they flow. The distant prospects will remain unchanged, because their very distance makes invisible the superficial alterations which man effects.

Thus the only changeful and changeable element in the general as well as the local landscape of the domains in question is the vegetation which clothes the surface everywhere, excepting only such bare areas as consist of naked rock or water. Much of the most striking scenery of the world is almost or quite devoid of verdure; but here in New England we cannot get rid of verdure, even if we would. Bulrushes insist upon crowding every undrained hollow, bearberry carpets barren rocks, and a great variety of vigorous trees and shrubs have had to be continually and forcibly prevented from re-occupying such parts of the slopes between the rocks and the swamps as men have laboriously cleared at different times for the purpose of raising food crops or grass for the feeding of cattle. The original forests disappeared long ago. Where once stood towering pines, there are to-day perhaps thickets of scrub oak, and where great hemlocks shaded damp, mossy cliffs, there may now be sun-baked ledges with clumps of sweet fern in their clefts. While seedlings have been pushing their way into the clearings at every opportunity, fire and the axe have made great changes in the vegetation of the wilder woodlands during the last two hundred years; and all these changes have necessarily had their effect on the scenery.

The present investigation is not, however, an historical or even a scientific inquiry. Its purpose is simply to record the present condition of the verdure of the reservations, to note the effect in the landscape of the several predominant types of vegetation, and to inquire into the origins of these various types only so far as may be necessary to determine how best to encourage, control, or discourage the existing growth, with a view to the enrichment of that treasure of scenery which the reservations have been created to secure and preserve.

THE METHODS PURSUED.

For the purpose of making a record of the present condition of the vegetation, sun prints from the original tracings of the topographical maps of the several reservations were carried into the field, together with ordinary catalogue cards. The maps used were drawn to the scale of one hundred feet to an inch and showed roads, paths, stone walls, conspicuous rocks and large trees, in addition to contour lines indicating every difference of

five feet in elevation. Each of the seventy separate survey sheets was designated by a letter and number (for example, Fells B. 3), the dozen or more cards bearing notes referring to each separate sheet were also numbered (for example, $\frac{\text{Fells B. 8}}{13}$), and the card numbers were entered on the survey sheets at the several points to which the corresponding notes had reference. Different observers engaged in different parts of the broad field have doubtless followed somewhat different standards in making notes, but the endeavor of all has been to record every marked variation in the existing vegetation, together with such information as to the origin of each peculiar type as could be gathered either from study on the spot or from persons acquainted with the neighborhood.

THE PRINCIPAL TYPES OF VEGETATION.

On comparing and studying the returned map sheets and card notes, it gradually became clear that what at first seemed a hopeless confusion of isolated facts was after all resolvable into a rational order, and that the vegetation of the reservations can be truly described as composed of six principal landscape types or forms, the peculiarities of two of which depend chiefly on natural topographical conditions, while the distinguishing features of the other four types are principally derived from the past work of men and of fire in the woodlands. Perhaps the most interesting fact established by the inquiry is just this — that the woods of these reservations, which are commonly thought of and spoken of as “wild,” are really artificial in a high degree. The peculiar growth of dwarf trees and bushes which occupies the highest summits of the Blue Hills, and the equally peculiar growth of shrubs and herbs which fills the wetter swamps, have not been worth molesting with the axe; while the bare ledges of the hill-tops have defended the summit type of growth from fire almost as effectually as the presence of water has defended the swamp type. On the other hand, all the intervening slopes and plains of the reservations have been chopped over, or completely cleared, or pastured, or burnt over, time and time again since the settlement of Massachusetts. Much of the resulting vegetation and, consequently, much

of the scenery of the reservations is monotonous, insipid, and unlovely ; but it must be added that those parts in which men have lived longest, or worked hardest, are often beautiful in a high degree.

The following are the principal types of the vegetation of the reservations which are about to be reviewed in the order here set down :

Types dependent chiefly on topographical conditions:

1. The Summit.
2. The Swamp.

Types dependent chiefly on the interference of men :

3. The Coppice.
4. The Field and Pasture.
5. The Bushy Pasture.
6. The Seedling Forest.

It is, of course, to be understood that all these types, and particularly the last three, run together more or less, and that in sketching their distribution on the [accompanying] maps, all that is intended is to indicate the observer's judgment as to which type predominates in each locality.

1. *The Summit Type.* Whether the lofty, rocky summits of the Blue Hills were ever covered with high forest is not quite clear, but that the scanty soil of these hill-tops is clothed to-day with an interesting and distinctive kind of vegetation is very noticeable. This vegetation is generally low, seldom exceeding five feet in height, except where wind-bent forms of pitch pines, hickories, chestnuts, oaks, or other trees occasionally rise above the dense mass of ground-covering shrubbery. This shrubbery consists for the most part of closely interlocking plants of scrub oak, forming thickets almost as impenetrable as the chaparral of the Western States (Illustration 1*). Mixed with the scrub oak are occasional patches of other bushes, of kinds which are capable of withstanding adverse circumstances, such as sweet fern and chokeberry ; and where the gravelly soil is thin-

* The numbers in parentheses in the text refer to the numbered illustrations. The original paper is illustrated with 154 photographs and six sepia sketches, from which illustrations have been selected to accompany the paper as here printed.

nest, broad mats of bearberry are not uncommon. This growth has generally escaped destruction by fire, but where it has been killed so that raw soil has been exposed, the gray birch has seeded itself and taken at least temporary possession. Many of the higher, steeper, and more naked crags have wholly escaped all recent fires and the axe as well, and here are found quaint stunted forms of pitch pines and other hardy trees (2). The irregular upper edge of the ordinary forest in these hills (the "tree line" as it would be called in the mountains) also exhibits many more or less distorted growths of the hardier species of trees, and forms strong and sharp foregrounds for the panoramic views.

Speaking generally, this summit growth is altogether appropriate, interesting, and pleasing. It is generally low enough to enable the broad prospects from these hill-tops to be sufficiently well commanded. Its dwarfness also tends to increase the apparent height of the hills and to set off the grand or picturesque forms of their ledges and crags. It ought to be the settled purpose of the administration of the reservations to foster the peculiar character of this vegetation by removing such few inappropriate species as may occasionally obtain a foothold on the heights, and by carefully refraining from any trimming or clearing of those crooked growths which give character to this type of scenery. It should be added that the type is in some measure imitated on even low-lying ledges and tracts of ledgy ground throughout the reservations; and that even where it is only a minor element of local scenery, it should be encouraged and helped. Rock scenery is indeed so interesting, and characteristic vegetation so enhances this interest, that it will be advisable (as is noted later) to remove much inappropriate and rock-concealing vegetation from the craggy parts of the reservations, and to induce the spreading therein of dwarf forms chiefly (52) (53).

2. *The Swamp Type.* In marked contrast to the vegetation of the prospect-commanding heights is the verdure of the many sheltered and secluded swamps and wet valleys. Small, roundish swamps, generally bordered, in part at least, by ledges, are very common in the three larger reservations (3). The ordinary forest presses close about these hollows, but owing to lack of drainage their level floors are too wet for most trees, although the stumps of white pines are often found in them. Bulrushes are to-day the usual occupants of the

deeper parts of these wet spots, while much beautiful shrubbery of clethra, azalea, winterberry, and other sorts fringes their edges. The local scenery of these sunny openings in the monotonous woods is often extremely pleasing, as when some bold rock projects into the level of rushes (4), or when the encircling fringe of bushes is unbroken. It is evident that these places ought not to be meddled with, save for good reasons. Their peculiar beauty can be long preserved if the natural drainage is not altered, and if such incongruous species as may from time to time appear are promptly removed.

According as these bowls or hollows in the surface are worse or better drained than in the typical cases just mentioned, the vegetation varies. Such high-lying or uncommonly large bowls as have not yet been completely filled by washings from the surrounding surfaces, show open water in their centres at least, and if the breadth of water is not so great as to generate waves, it is sometimes wholly or in part surrounded by a "floating or quaking" bog composed of matted roots of such low-growing woody plants as cranberry, cassandra, andromeda, and the like. No shrubberies can be lovelier than some of these, which, beginning with low bushes or rushes at the water's edge, increase irregularly in height as they recede from the water, until they finally merge into the margin of the surrounding woods (5). It is noticeable that such shrubberies are best developed where the supply of water is most constant; as at Turtle Pond in Stony Brook reservation. Where wetness alternates with dryness, the button-bush seems to feel at home, and covers large areas, almost without companions. Again, where the conditions are just right, and men have not cut it out, the white cedar still holds possession, with its exceedingly dense and dark growth (6). On the other hand, such hollows and valleys as have better drainage than the typical swamps first cited, tend to clothe themselves with trees in addition to the usual shrubs of wet places. Where such trees thrive the shrubs slowly disappear and a wood results much like the ordinary forest (7). In any general view over the reservations the brook valleys are easily traceable by the general coloring of the trees which fill them. The gray birch is frequent, but the characteristic tree of such wet hollows is now the red maple, which, with its haze of blossoms in early spring, its brilliant colors in early autumn, and the peculiar gray of its twigs in winter, tints all the valleys of the reservations, and brings them out as on a map.

In places where the conditions are suitable for the growth of shrubs like high-bush blueberry, clethra, and the like, the maple often tends to intrude itself where it could well be spared. The upland woods are quite sufficiently dense, continuous, and monotonous without filling the wet bush-covered openings with additional tree trunks. The local scenery of such bushy openings, the bounding ledges or slopes of rocky *débris*, cannot be seen or appreciated if maples are to be allowed to crowd in. On this account trees ought eventually to be kept out of many of these places for the encouragement of the bushy ground cover; and particularly is this the case where the removal or suppression of maples will disclose above the bushes and between the framing woods glimpses or vistas of far blue distances.

3. *The Coppice Type.* The summit and swamp types of vegetation already reviewed have been but little molested or changed in any recent years, but, with mention of the maples of the better drained lowlands, approach is made to the main body of the woods which, modified past recognition by both axe and fire, still occupies the smooth or ragged uplands between the swamp and the highest summits. The transition from the lowland woods of maples to the upland forests of oaks, chestnuts, and other species, is generally quite sharply defined, whether the dry woods consist of seedling growth (as in 8), or of sprout-growth (as in 9). Sprout-growth, or coppice, greatly predominates in the woodlands under consideration. It consists of trees sprung, not from seed, but from the axed or burnt stumps of the trees of a previous generation (10). In some parts of the reservations as many as six or eight crops have been taken by means of the axe from the same stumps (11); twenty to thirty years having been allowed for the growth of each crop.

Much might be learned from study of this common practice of gathering periodical wood crops from lands too rough for the nicer operations of husbandry — how it tends to reduce the woods to masses of the few species which sprout with the greatest vigor and suffer the least from fire; how the extremely rapid growth of the first sprouts from old stumps strangles the small seedling trees which may have started amid the undergrowth, and thus preserves the supremacy and continuity of the coppice; and so on. Our present concern, however, is only with the appearance of coppice or sprout-growth, and particularly with the part it plays in local and broad scenery.

The interior of a high coppice wood is seldom as beautiful as the interior of a seedling forest, not to speak of an open grove. It lacks the pleasing variety of natural woods, composed as such woods usually are of numerous competing kinds of trees and underwood. The crop-like or artificial nature of sprout-growth is obvious at a glance (12), and cannot be concealed by an occasional though rare luxuriance of undergrowth or pretty play of light and shade. Along paths and roads the monotonous effect of its crowded vertical lines is tedious in a high degree (13). It is only when some cause or condition introduces a little unwonted variety either of form or kind of tree or undergrowth, or when a distant vista catches the eye, that the paths through the sprout-lands are not comparatively dull. Along the edges of old or broad roads, clearings, swamps, or ponds, and where ledges or other obstructions form a defence against too near neighbors, both masses and single specimens of sprout-trees naturally send out low branches and take on more interesting forms — even remarkably striking forms in many cases (14) (15). On the other hand, the general appearance of the ordinary sprout-growth, when it is seen from a distance in any broad view over the reservations, is as dull and tame as is its usual appearance close at hand. Its crowding swarms of nearly uniform trees press closely down to the swamps, climb close up to the summit ledges and invade their slopes of *débris*, crowd the hollows and notches between rocks, and generally tend to wrap both the softer and bolder features of the general landscape in the same monotonous blanket of impenetrable twigs and leafage. A kind of vegetation which is so little beautiful in itself ought not to be permitted to take possession of those parts of the public reservations which would be more interesting were the screen of close-set tree trunks wholly or partly removed. Here, for example, is a hill (16) on which the sprout-growth is not so thick as it often is, and yet it nevertheless conceals effectually the fine rock-buttresses of the slope, changes what would otherwise be a picturesque sky-line into a level line of twigs, and in summer reduces the whole bold hillside to a soft bank of leaves. The opposing cliffs and talus slopes of the narrow valleys of the Blue Hills, many lesser knobs and ledges, and most of the elevated vista-commanding “notches” of the Hills and Fells are similarly smothered in curtains and veils of sprouts, which in great measure nullify the potential beauty of the scenery (17) (18) (54).

Fortunately, the one constant ally of the axe of the wood-chopper in the work of destroying the beauty of the woodlands of the reservations is now presumably under control. Ground or leaf fires have ordinarily spread through the woods almost every spring and autumn, charring the base of the trees without killing them (19); but about once in every ten or twelve years the dry accumulations of chopped tree-tops and fallen wood have furnished material for conflagrations hot enough to kill trees as well as ground-cover over large areas. In such cases the dead or dying trees stand for a year or two, intact but naked, while new sprouts shoot up from their roots (20). Later, the dead trees lose their now dry twigs, and fall from time to time, forming almost impenetrable barriers of sticks, supremely well adapted to serve as kindling for new flames. The greater part of the woodland of Blue Hills reservation was in this dangerous and unsightly condition at the time the reservation was acquired, and the woods of the Fells and Stony Brook reservations were largely in the same miserable state. For the sake of the safety of the living growth, it was, therefore, necessary to clear away the accumulations of dead wood, and this has been done by burning it in heaps in winter. When full-grown coppice is thus killed by fire or felled by the axe, the stumps, as has been noted, push out many vigorous and crowded shoots at the first seasonable opportunity. If care be taken to prevent such sprouting, by bruising the shoots when tender, or by sending sheep to browse on them, the stumps can be eventually killed, so that they will sprout no more, and clearings, pastures, or fields may be the result. If, however, the stumps are not killed, the ground is soon so thickly covered by the new sprouts that it cannot be seen, and can hardly be traversed. It makes little difference whether such new sprout follows the killing of high sprout by fire, or whether it springs from the stumps of felled trees, its appearance is equally dreary and monotonous. If the fire-killed trees are not entirely removed (as they now have been throughout most of the reservations), or if they are allowed to slowly fall to pieces amid the tangle of new sprouts (21), the woodland scenery becomes still more dismal and squalid. It would, indeed, be hard to exaggerate the ruined appearance of such scenes; and yet they were met with on every hand when the reservations were first acquired.

As in the case of old sprout, the presence of young sprout is particularly unwelcome when it screens from

sight any fine rocks, or any richly verdurous swamp openings, as well as when it blots out possible vistas. It sometimes springs from the stumps of such deciduous trees as once were mixed with conifers on rocky hillsides (22), and in such cases it ought to be suppressed at once, for the encouragement of seedling pines or other trees known to be long-lived and appropriate in such situations. The occasional broad views obtained from "clearings" made just previous to the acquisition of the reservations, or from areas from which fire-killed old sprout has been recently removed, are often fine, but they are generally only temporary (55); for the growth of the young sprout will obliterate most of these prospects in a very few years, together with many now pleasing glimpses of the ponds in the Fells, of the distant sea (56), or of the Great Blue Hill seen through some chance valley or ravine (57). The growth of the young sprout in other recent clearings will also once more shut out from view such bold hill-forms and foreground rock-masses as are temporarily visible and enjoyable just at present (23). Many of these chance and fleeting openings in the too continuous and too monotonous woods of high sprout ought certainly to be made more permanent, if only to illustrate how the removal of sprout-growth from large surfaces, and particularly from among the rocks, will enrich and vivify the scenery.

To neither the old nor the young living coppice has any attention yet been given. The only care the previous private owners gave it was to cut the sprout-growth clean whenever the crop seemed ripe, that is, whenever most of the trees were large enough for cordwood, or sometimes for chestnut posts. To thin the sprout-growth so as to develop trees of more spreading habit was never worth while from the wood-lot owners' point of view; but such thinning has been practised at a few places within the limits of the reservations by persons desirous of making their lands more attractive in the eyes of purchasers of suburban house lots, with results which, though startlingly ugly at first, serve the purpose after a few years (24). To treat the sprout-lands of the reservations in this manner throughout their length and breadth would, however, be inadvisable, since the result would be quite as monotonous and artificial in its way as is the present dense growth. Moreover, in most of the rough lands of the reservations no type of growth could be more inappropriate than that which consists of separated and spreading trees. In such lands there is not enough soil to grow really fine separate or specimen trees;

and again there are few sprout-trees which are sufficiently sound at their necessarily deformed bases to make them likely to live more than a comparatively small number of years. In view of the uninteresting quality of sprout-growth as an element of scenery, and of these grave objections to any general thinnings, it ought to be the settled policy of the management of the reservations to gradually effect the substitution of mixed seedling growth in place of the existing sprout-growth. Now that fires are prevented from spreading, seedlings of many species of trees will soon spring up wherever the sprout-trees are not too thickly set; pine seedlings here, hemlocks and beeches there, birches among these rocks, hickories, chestnut-oaks, and so on. Such seedling underwood is noticeable in many places to-day (25) (26), and wherever it exists, and wherever it appears, it can and ought to be given possession by gradually removing the sprout-trees and killing their stumps. In such cases the high sprout-trees should first be severely thinned, and then wholly removed perhaps two years later, so as not to expose the seedlings to new conditions with too great suddenness. In the high vista-commanding notches, as well as on the higher slopes, and in other places where few trees, whether sprout or seedling, are really desirable, it will be best to fell all the sprout-growth at once and to kill the stumps. How beautifully a level or ledgy pasture will clothe itself with seedling shrubbery and trees will be illustrated later. It is sufficient to point out here that intelligent management will find it easy to gradually replace the crop-like copice with vegetation much more beautiful in itself and also more conducive to beauty of scenery.

4. *The Field and Pasture Type.* The scenic value of even temporary clearings in woods has just been mentioned; but the importance and beauty of more lasting open places, such as fields and pastures, is incomparably greater. In this climate almost all treeless and grass-clothed areas, if not quite all, are due to the labor of men, supplemented by the browsing of domestic animals. For a year or two the stump-studded slopes or levels destined to be converted into pastures or fields are ugly enough in themselves, though they may open to view certain previously invisible prospects (27); but the more or less bare earth between the now dead stumps soon springs to life, and covers itself with plants of many sorts — often with berry bushes, which will yield great crops of fruit so long as the bushes are not browsed down by animals, or overshadowed by seedling plants of

taller species. Much work devoted to dragging out stumps and stones is necessary before such lands can be called even rough fields. Most of the few smoother fields of the reservations are products of the slow labors of many generations (28) (29); while the hard and close sod of the old pastures is the result of many years' continuous browsing (30).

After traversing long stretches of monotonous coppice, to emerge into grassy openings of this sort, set with occasional spreading trees, bordered or framed by hanging woods, beyond which rises perhaps some bold hill or ledge, is like coming to a richly interesting oasis in the midst of a bare desert, save that our desert is a close-ranked wood, and our oasis a sunny opening in it. Such man-made oases are specially lovely when they lie in hollow glades, or intervalles, where there is moisture enough to keep them fresh and green in dry seasons (31); and even the still wetter meadows, from which crops of only the swamp grasses are obtainable, make welcome and interesting incidents in landscape (32).

It seems plain that few, if any, of the existing grassy areas of the reservations can be spared without loss of scenery, and they should therefore be maintained by systematic mowing and pasturing. In the future some additional grassed openings will be desirable in smooth and hollow spots where provision will be needed for the gathering of people, or for the setting forth of some specially interesting local scenery; but as such grass lands are troublesome to maintain, they ought not to be multiplied unduly. A ground covering of bushes will serve as well as grass when it is only a question of keeping a view open and there is no need of providing strolling-places for crowds, or smooth playgrounds for boys or children.

5. *The Bushy Pasture Type.* Of the several types of vegetation thus far mentioned, the coppice type occupies by far the largest part of the new reservations, while the summit, swamp and field types cover approximately equal but much smaller areas. It now appears that almost all the remaining area of the reservations has been at one time or another grass land, field, or rough pasture land, and that the growth which now covers it more or less densely results from the more or less complete abandonment of the use and care of these lands by their owners. Why these considerable areas, cleared with great labor and situated near growing towns, should

have been thus abandoned, it is not for us to ask, though the subject is one of considerable historical and economical interest. It is only to be noted here that the peculiar vegetation of these lands combines with their topography to form some of the most pleasing scenery of the reservations.

Even where cattle are still pastured, it is common enough to find plants of red cedar starting up from seed here and there (33). Other seedlings are bitten off as fast as they appear; but the foliage of the red cedar, prostrate juniper, pitch pine, and a few other species is not edible, and so these plants survive and spread in pastures, unless they are burnt or rooted out by men. Sometimes, as at Bear Hill in the Fells, the red cedar takes almost complete possession of the ground, often with striking effect, as when it stands up stiffly on bare rocks or clothes a stony hillside (34). As soon as cattle cease to browse a piece of land, the common and fast-growing gray birch mingles with the cedar, or takes possession of large areas by itself (35) (36). Abandoned ploughed land goes the same way in time, — cedars, pitch pines, and junipers forming the centres of many spreading islands of low or high shrubbery. The beautiful variety and intricacy of this bushy growth is often, and indeed generally, remarkable and delightful. With time the bushes of sweet fern, bayberry, blueberry, viburnum, and the like grow more and more numerous and entangled; and their combination with the dark cedars and the white birches often helps to form even broad landscape of rare beauty (37). Slowly, however, this type of landscape vanishes. From the midst, perhaps, of junipers which browsing cattle have avoided, or from clumps of crowded bushes, slow-growing oaks and other forest trees start up from seeds brought by the winds, birds, or squirrels (38). Slowly but surely as the great trees grow in height and breadth, the low-growing birches, cedars, junipers and bushes are overshadowed and as it were suffocated (39), and in the end the forest of seedling trees takes full possession.

On the other hand, it is obvious that the bushy stage or type is so beautiful in itself that it ought to be preserved in many places for itself alone; while it is equally obvious that in such parts of the reservations as command broad views which would be shut from sight by trees, this bushy ground cover will need to be encouraged in every possible way, even, if need be, by going through the natural order of felling trees, killing the stumps, and pasturing the rough ground for a limited time.

6. *The Seedling Forest Type.* That part of the total area of the reservations which is clothed with seedling woods is comparatively small. Here and there are found groups or patches of old seedling trees, like the hemlocks of Hemlock Gorge, Hemlock Pool, or Breakneck Ledge, which appear to be direct descendants of innumerable generations occupying the same peculiarly rocky ground. Here and there are found clusters or groves of white pines, apparently survivors of that generation of pines which not so very many years ago clothed the major part of the reservations (40). Single specimens of such surviving pines are not uncommon even in the midst of the sprout-lands. Like the hemlocks, they have sometimes survived in positions from which it was thought too difficult to remove them. A few of the larger pine groves have been leased by their owners as picnic grounds, and so have been more or less cleared of undergrowth and trampled. A few other woods, for example the Wolcott Pines, have been in some measure cared for and encouraged, without destruction of low undergrowth, during one or two generations (41). Here conflicting deciduous trees have been cut out, and the pines themselves thinned in some degree; while young seedlings from the parent trees have been protected both from fire and from too vigorous neighbors. The not unusual fate of the carelessly managed pine woods has been their ruin by fire, and the subsequent surrender of the ground to coppice or scrub oak (42). Here and there, again, are found crowded groves of deciduous trees, sprung from the small seedlings which, after long struggling in the shade of pines or hemlocks, shot up in vigorous competition with each other when the pines or hemlocks were felled. But almost all such deciduous seedling woods have long ago been cut down, and converted into that coppice which so shrouds the hills and valleys, and which on being cropped sprouts again so vigorously as to suppress such seedlings, whether evergreen or deciduous, as may have started in its shade. Beech trees often seed the land around them very thickly, hemlocks and pines also when they have a chance; and once in a while, though by no means often, such seedlings compete successfully with the surrounding coppice, and form colonies in the midst thereof (43).

In spite, however, of these and other exceptions to the rule, it is true that most of the now existing seedling woods of the reservations owe their origin to the activity of the winds and of the seed- and nut-eating animals in

the fields and pastures, prepared by men for their own purposes, but afterwards for one reason or another abandoned (44) (45). The trees which thus eventually obliterate the fields and pastures are of many species, forms, and habits, and the resulting woods are often varied, interesting, and beautiful as no coppice can be (46). The varied appearance of these woods and groves has been increased also by the diversity of their history since they first sprang up in the worn-out and abandoned pastures. Where, for example, all but the largest trees have at one time been felled and removed, the sprout-trees from the stumps now form, with the old seedling trees, a mixed type of vegetation common in the rougher parts of the Fells (47). Where pasturing has been resumed after certain trees have got a good start, and then the animals have been again removed, a secondary growth of seedling trees has subsequently mingled with the primary trees, often to the injury of the latter, but as often with pleasing effect (48). If, on the other hand, pasturing is resumed and continued after well-spaced trees have been developed, the resulting open groves present, perhaps, the most lovely local scenery of the reservations (49) (50) (51). The extreme rockiness and poverty of soil of most of the new domains make this pre-eminently "park-like" type of landscape impracticable, as well as inappropriate. Intricacy, variety, and picturesqueness of detail of rock and vegetation, combined with numerous and varied openings, vistas, and broad prospects, must serve as the sources of interest and beauty throughout the larger part of the reservations; but where smooth grass lands and broad-spreading trees exist, or are obtainable, they should certainly be preserved or secured. Compared with the sameness and dullness of the general scenery of the sprout-lands, the wealth of various and characteristic beauty presented by the relatively small area of fields, pastures, and seedling woods is indeed remarkable, and it is to be noted that this greater beauty tells in the broad scenery of the reservations as well as in that close at hand. The sky-lines and what may be called the profiles of the coppice woods are flat and nearly uniform. The masses of the seedling growths are bold in outline, as well as varied in detail, — all of which only adds weight to the argument that the crop-like coppice should be forced to give place gradually to seedling shrubbery and seedling trees.

CONCLUSIONS.

With regard to the relation of the vegetation of the reservations to the present and future scenery, perhaps the most important conclusions to be derived from this investigation are the following: It is found that the vegetation of the reservations is an exceedingly important component part of the scenery. It is found, moreover, that the present vegetation—its variety and beauty, as well as its monotony and ugliness—has resulted from repeated or continuous interference with natural processes by men, fire, and browsing animals.

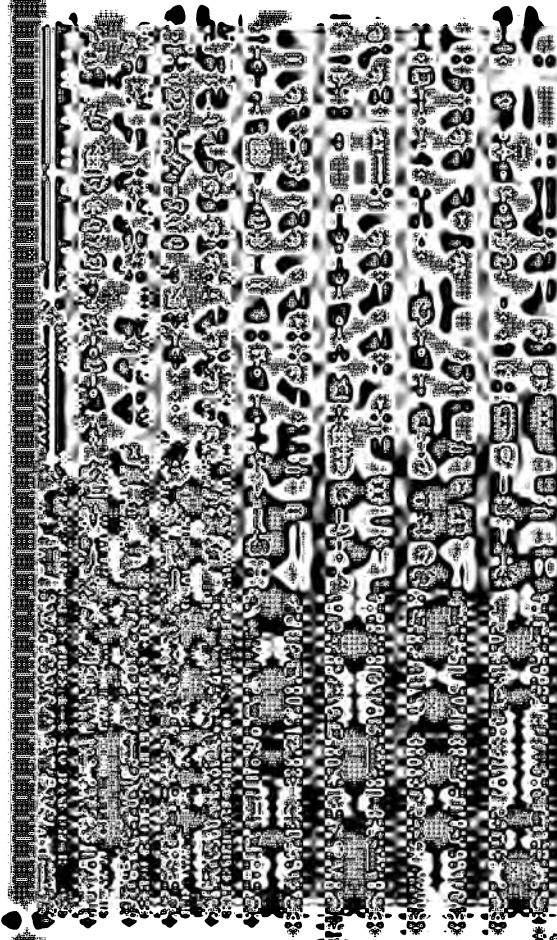
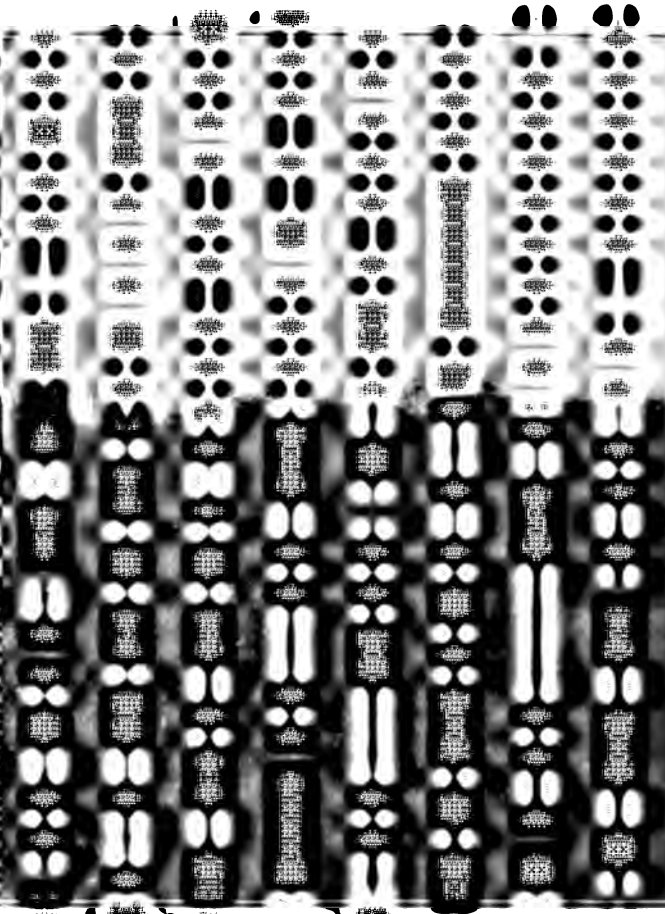
It follows that the notion that it would be wrong and even sacrilegious to suggest that this vegetation ought to be controlled and modified must be mistaken. The very opposite is found to be the truth; namely, that as the beauty or ugliness, and scenic appropriateness or inappropriateness of the present vegetation is due to the work of men, so also will the vegetation of the future be beautiful in itself, and helpful or hurtful to the general scenery, according as it may or may not be skilfully restrained, encouraged, or modified during the next few years.

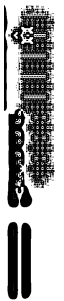
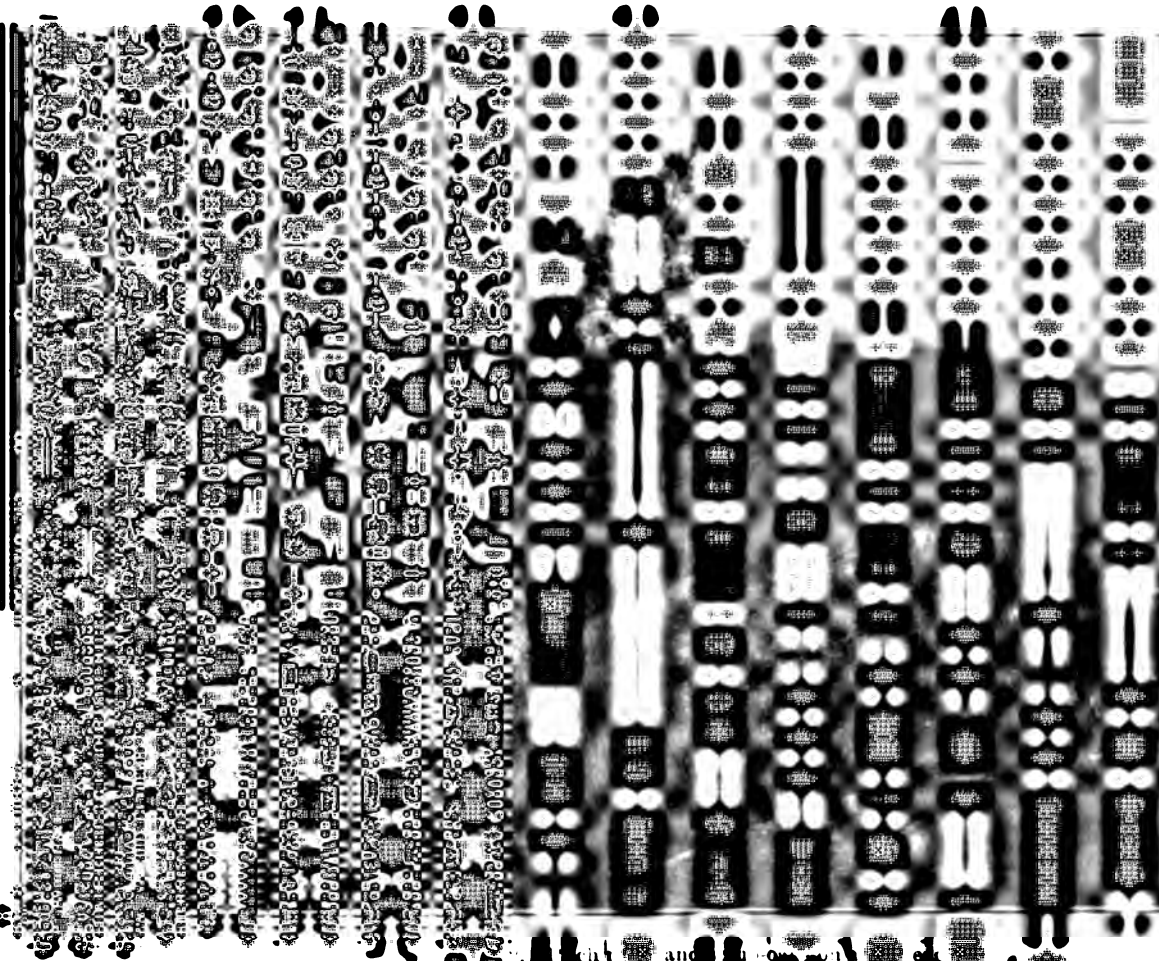
Simply to preserve the beauty of so much of this vegetation as is now beautiful, or the suitability of so much as is now suitable,—for example, the tree-fringed vales of grass, the open groves of great trees, the intricate shrubberies of old pastures, and the dwarf ground-cover of the hill-tops,—will necessarily require continual painstaking care. To restore variety and beauty in the now more or less degenerate or ruined woods will similarly demand intelligent attention. So to control, guide, and modify the vegetation generally that the reservations may be slowly but surely induced to present the greatest possible variety, interest, and beauty of landscape will particularly require skilled direction.

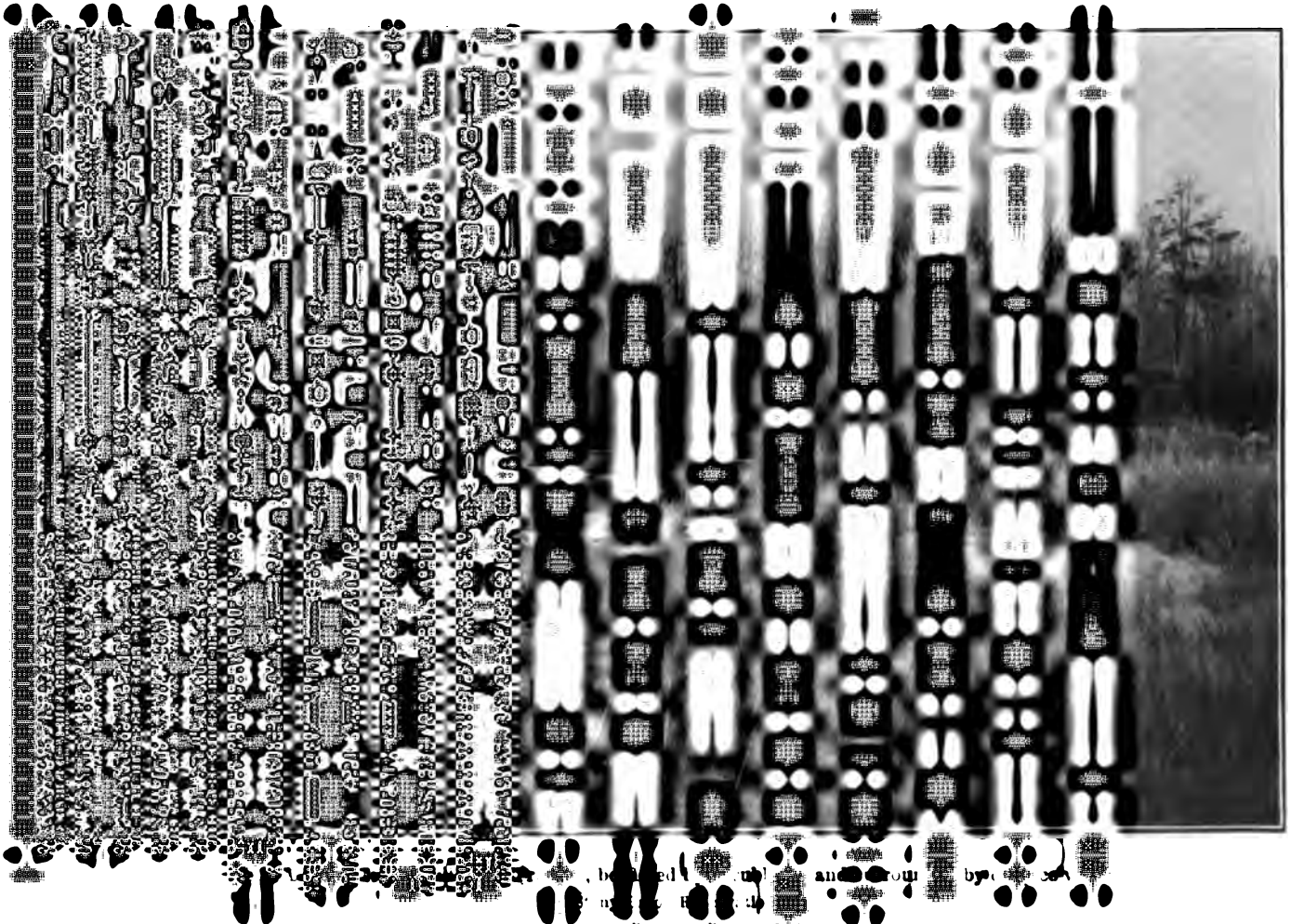
That such preservation, restoration, and enhancement of the beauty of vegetation and of scenery are only to be accomplished by the rightly directed labor of men, is the principal lesson taught by this study of the present condition and the past history of the vegetation of the reservations. *To preserve* existing beauty, grass-lands must continue to be mowed or pastured annually, trees must be removed from shrubberies, com-

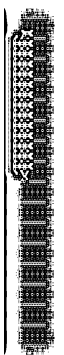
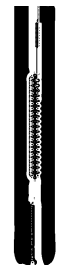
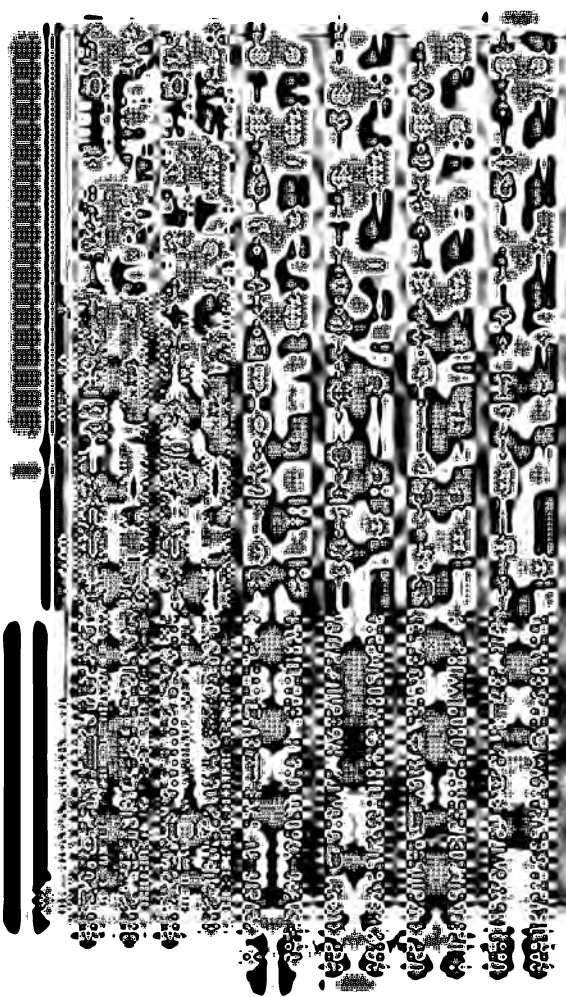
peting trees must be kept away from veteran oaks and chestnuts, and so on. *To restore* beauty in such woods as are now dull and crop-like, large areas must be gradually cleared of sprout-growth by selling the standing crop, subsequently killing the stumps, and then encouraging seedling trees to take possession. To prepare for *increasing* the interest and beauty of the scenery, work must be directed to removing screens of foliage, to opening vistas through "notches," to substituting low ground-cover for high woods in many places, and to other like operations which are, in some measure, illustrated by the accompanying diagrammatic sketches. The sooner all these kinds of work are entered upon systematically, the finer will be the scenery of twenty and fifty years hence, and the more economically will that scenery have been obtained.

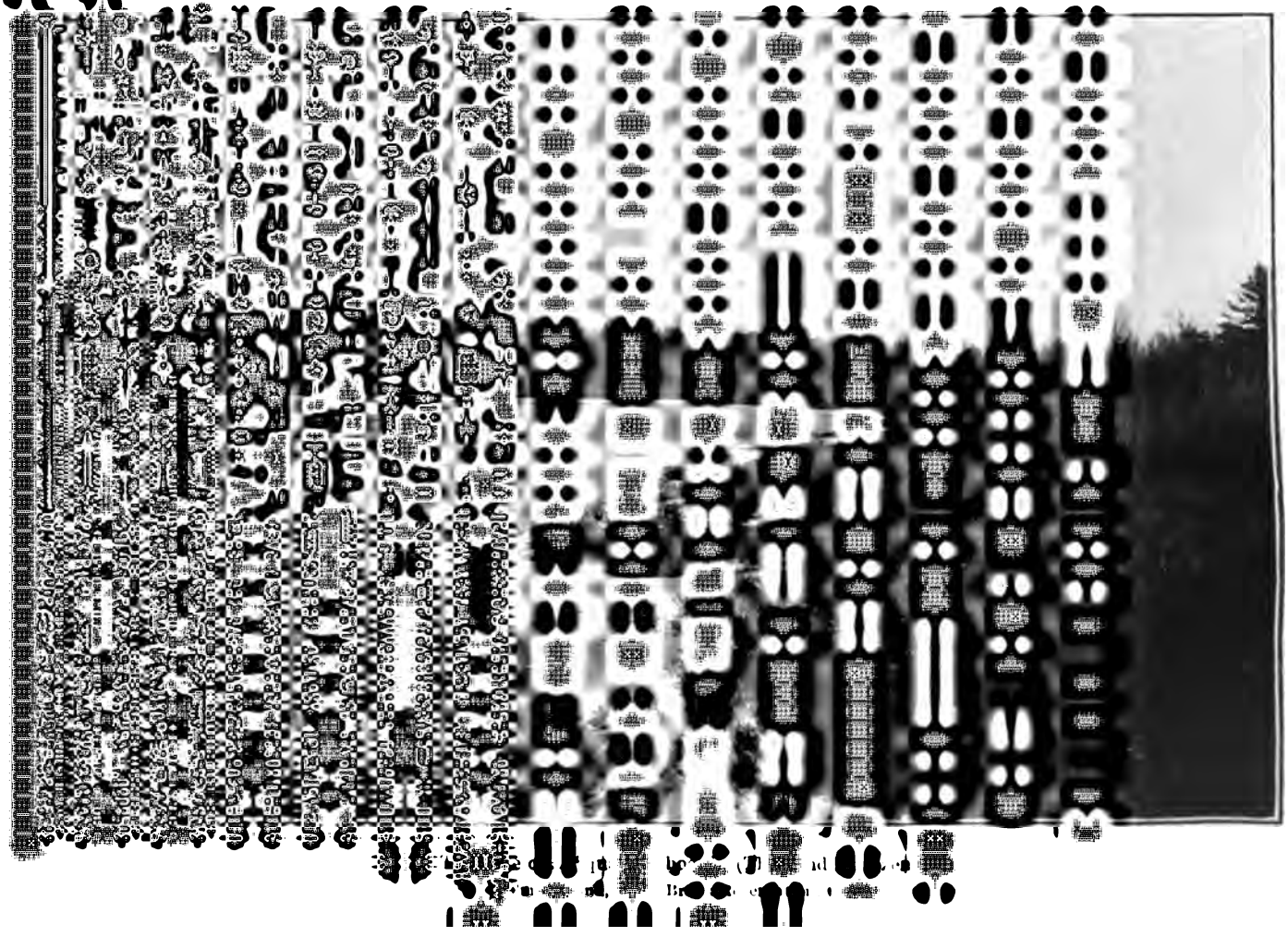
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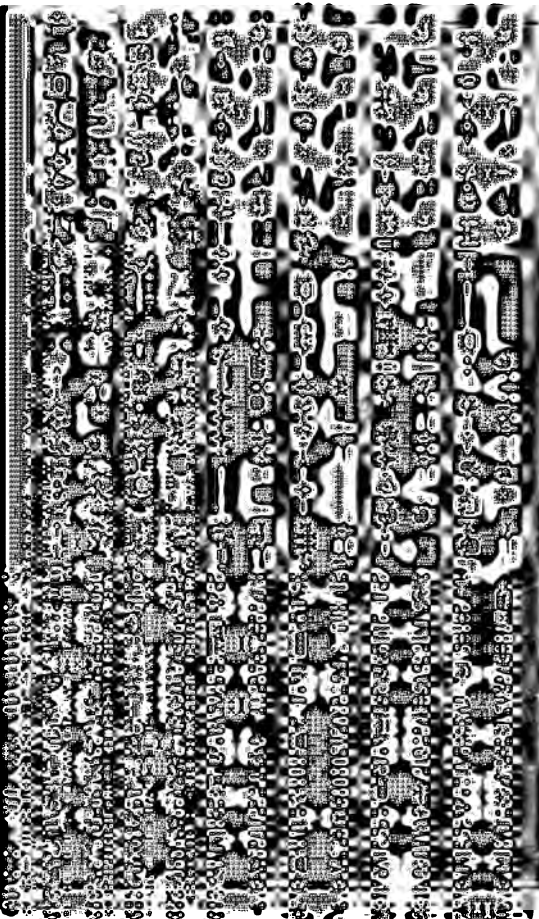
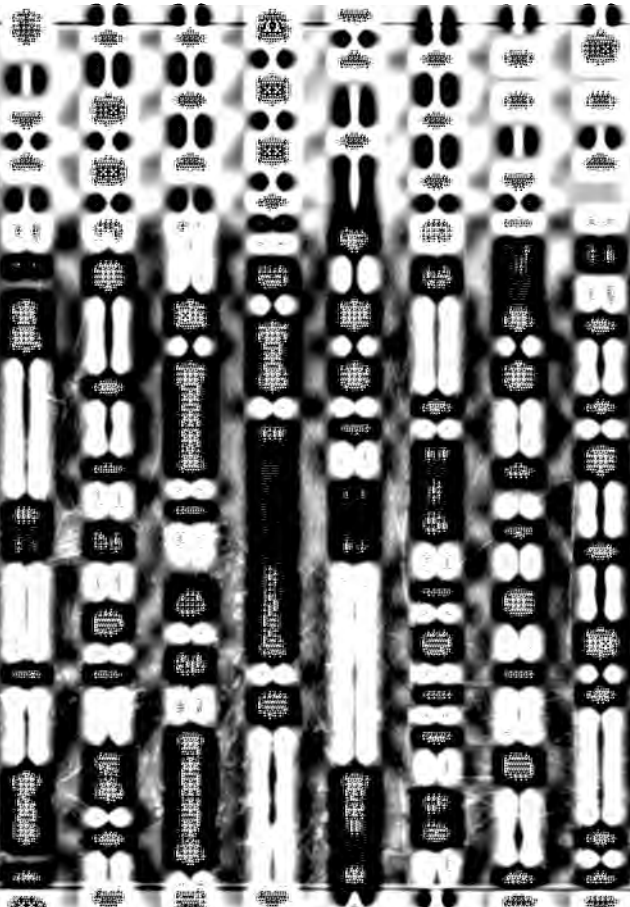


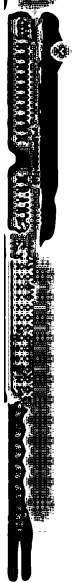
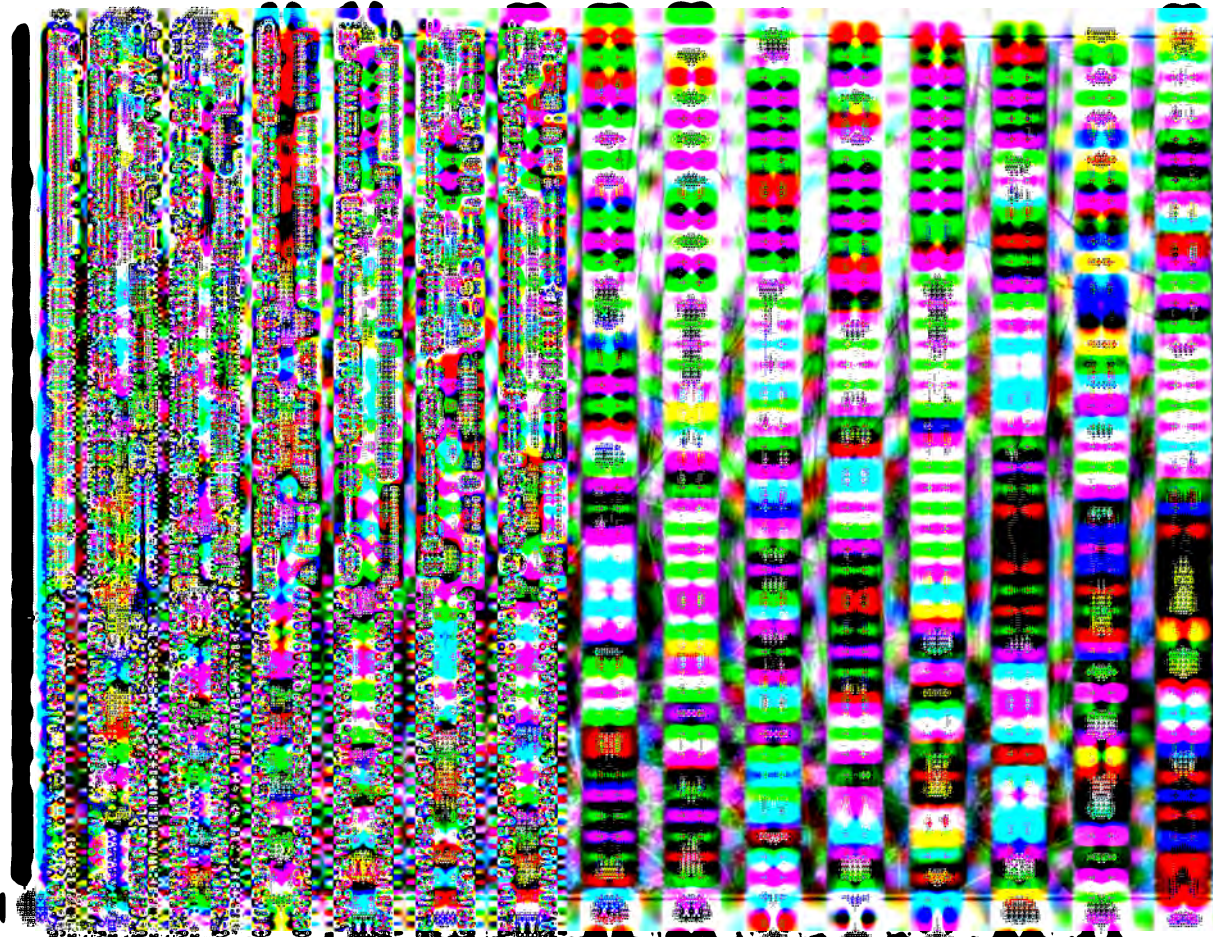


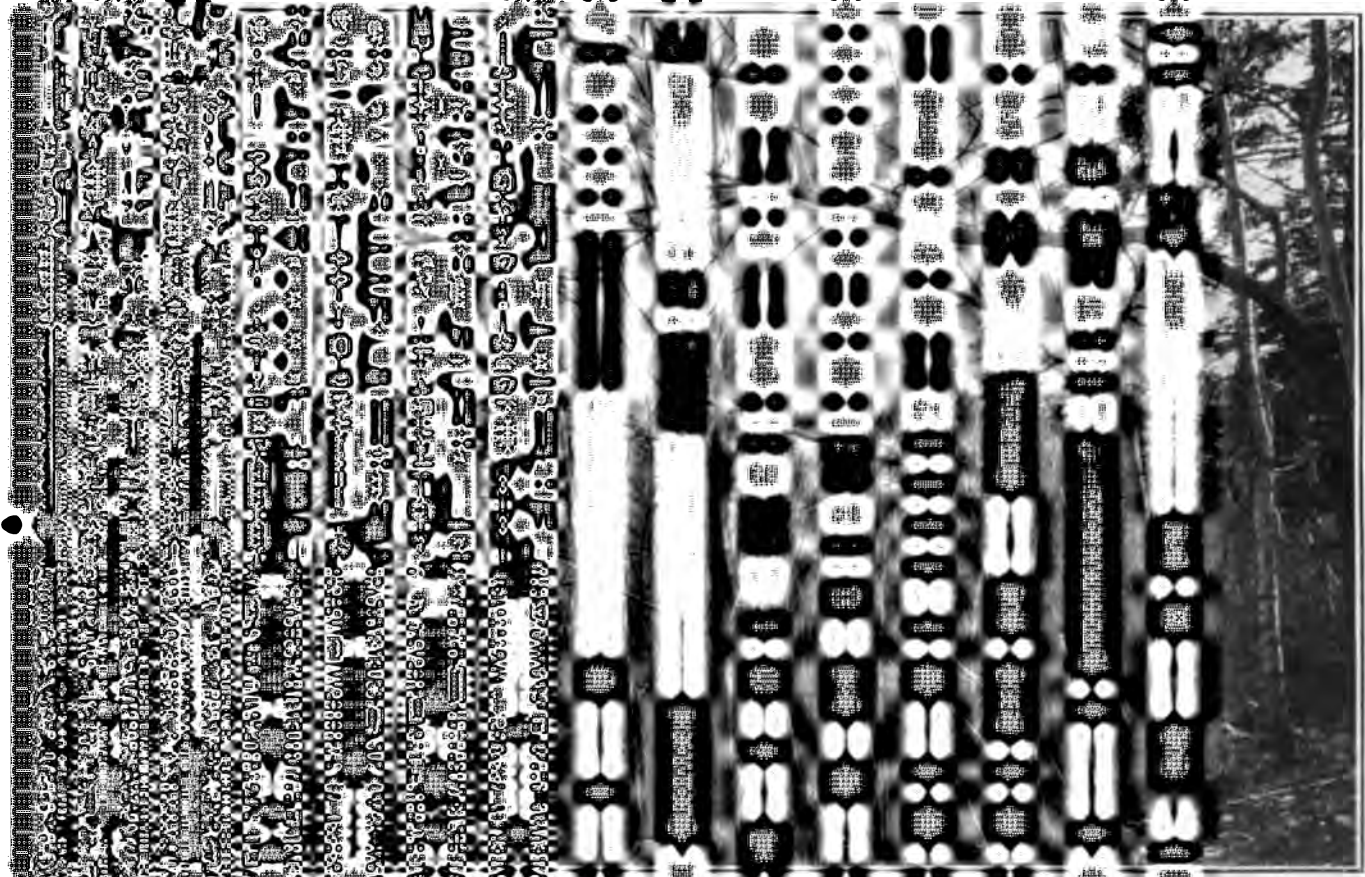




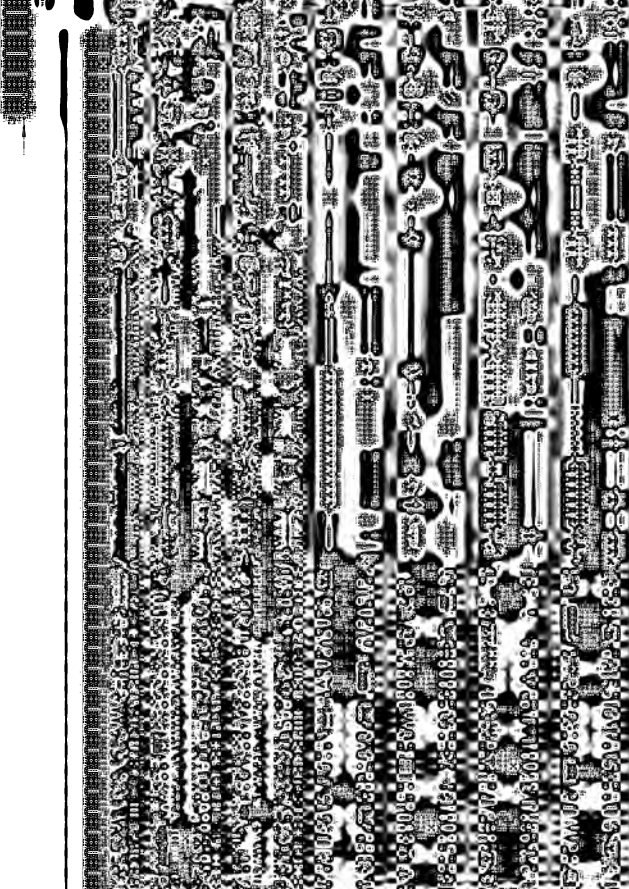
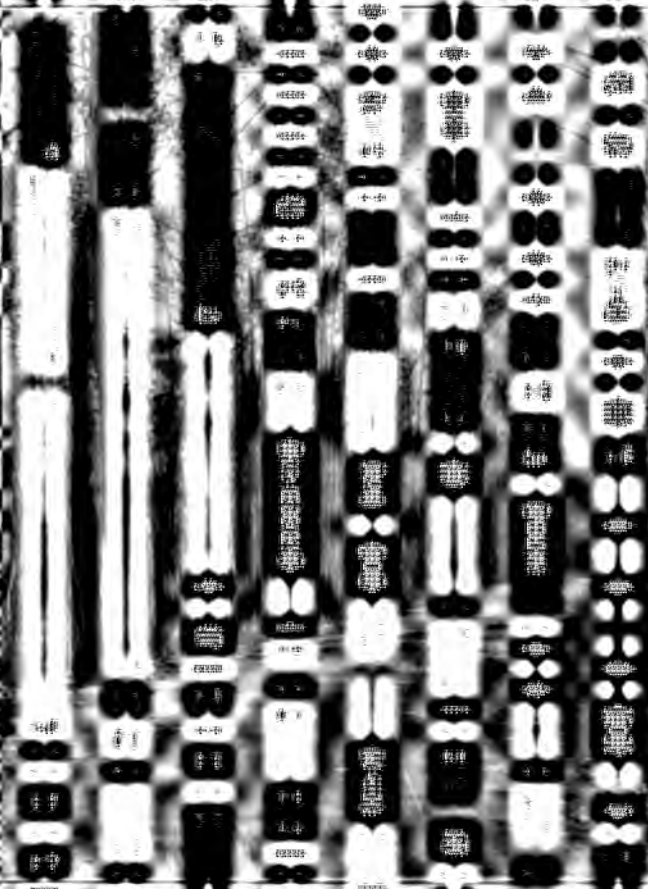








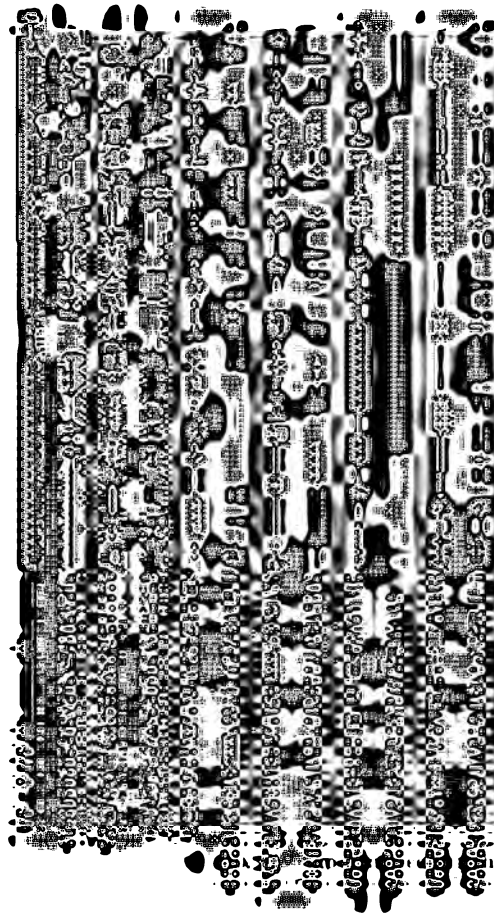
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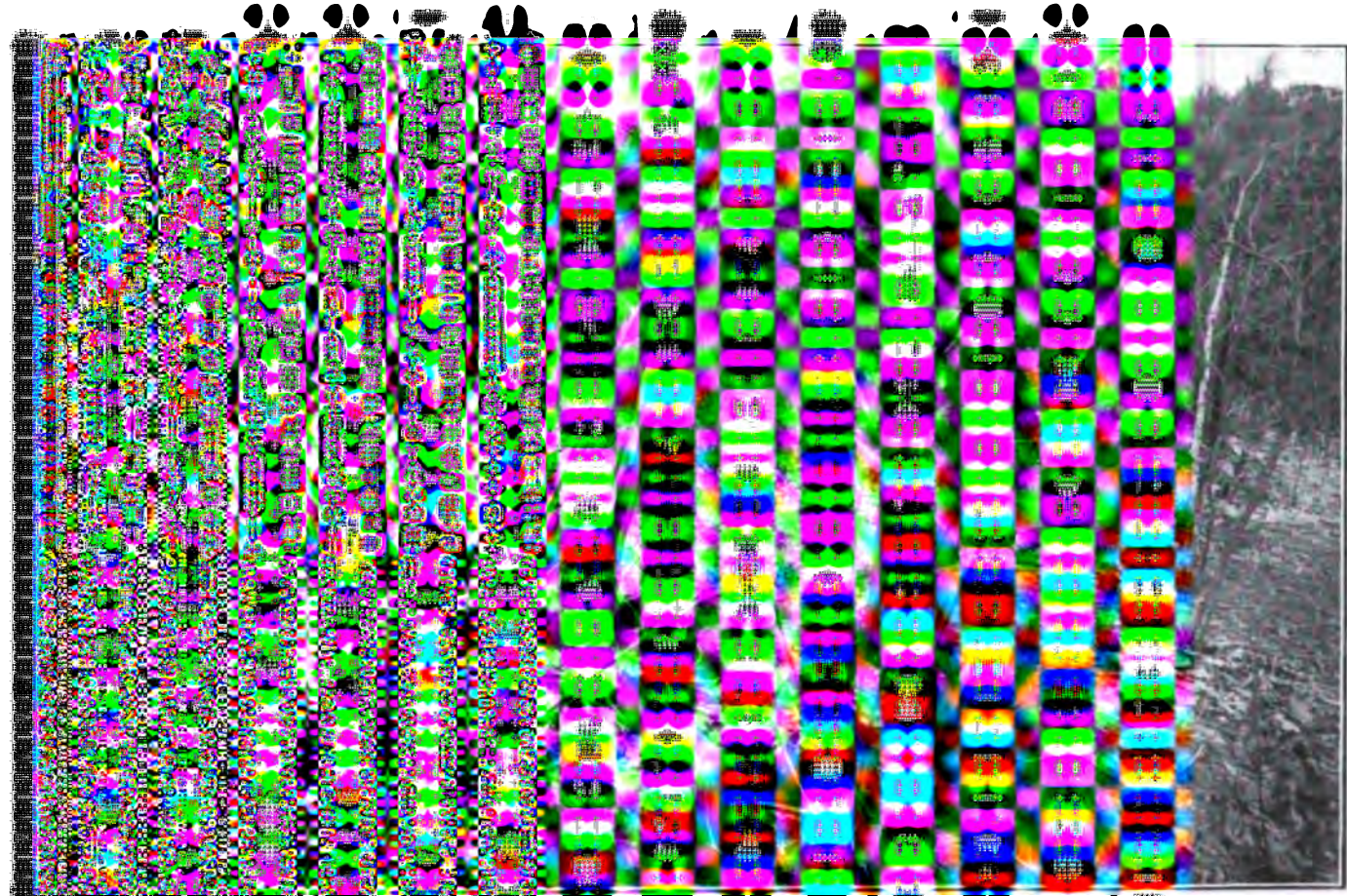


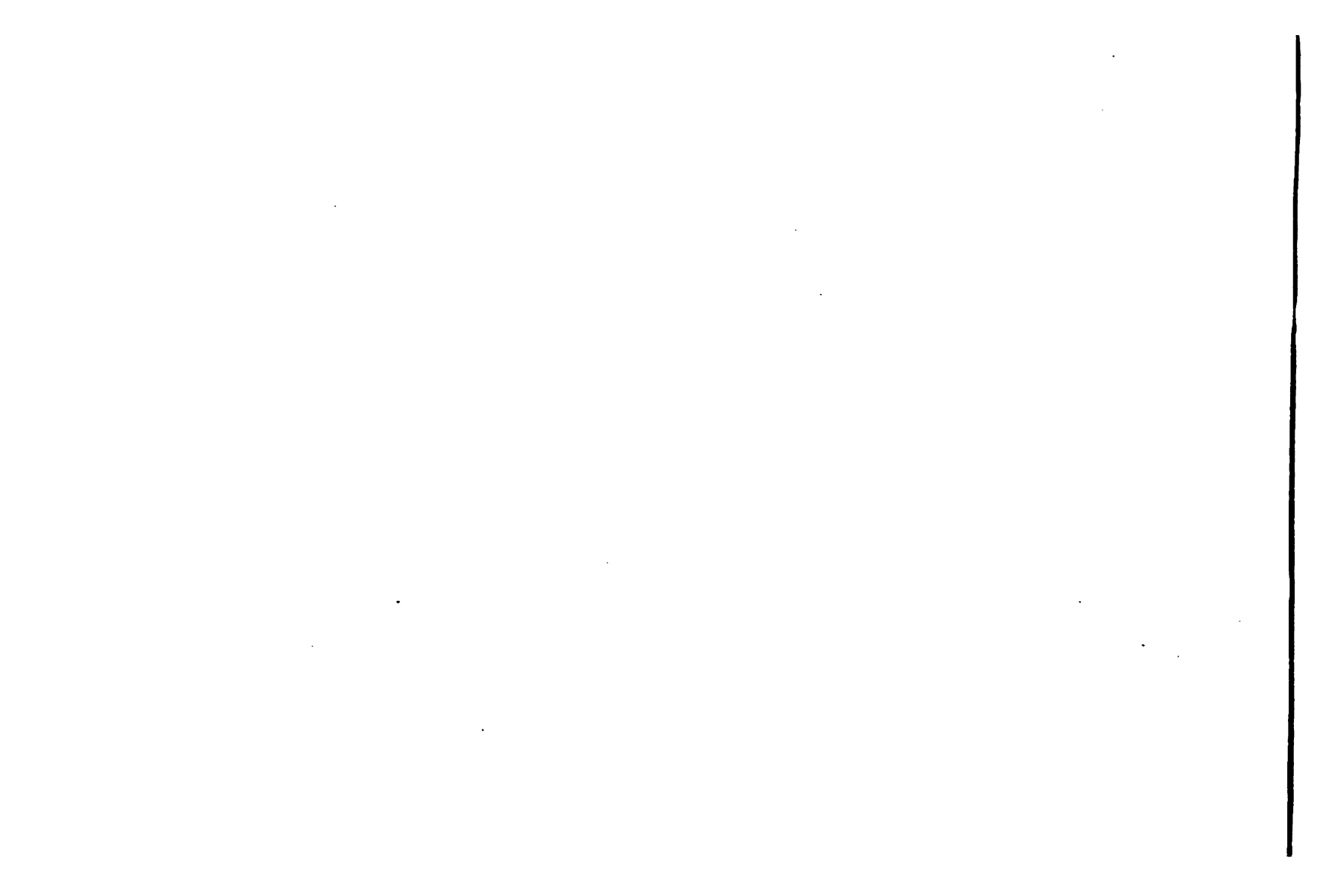
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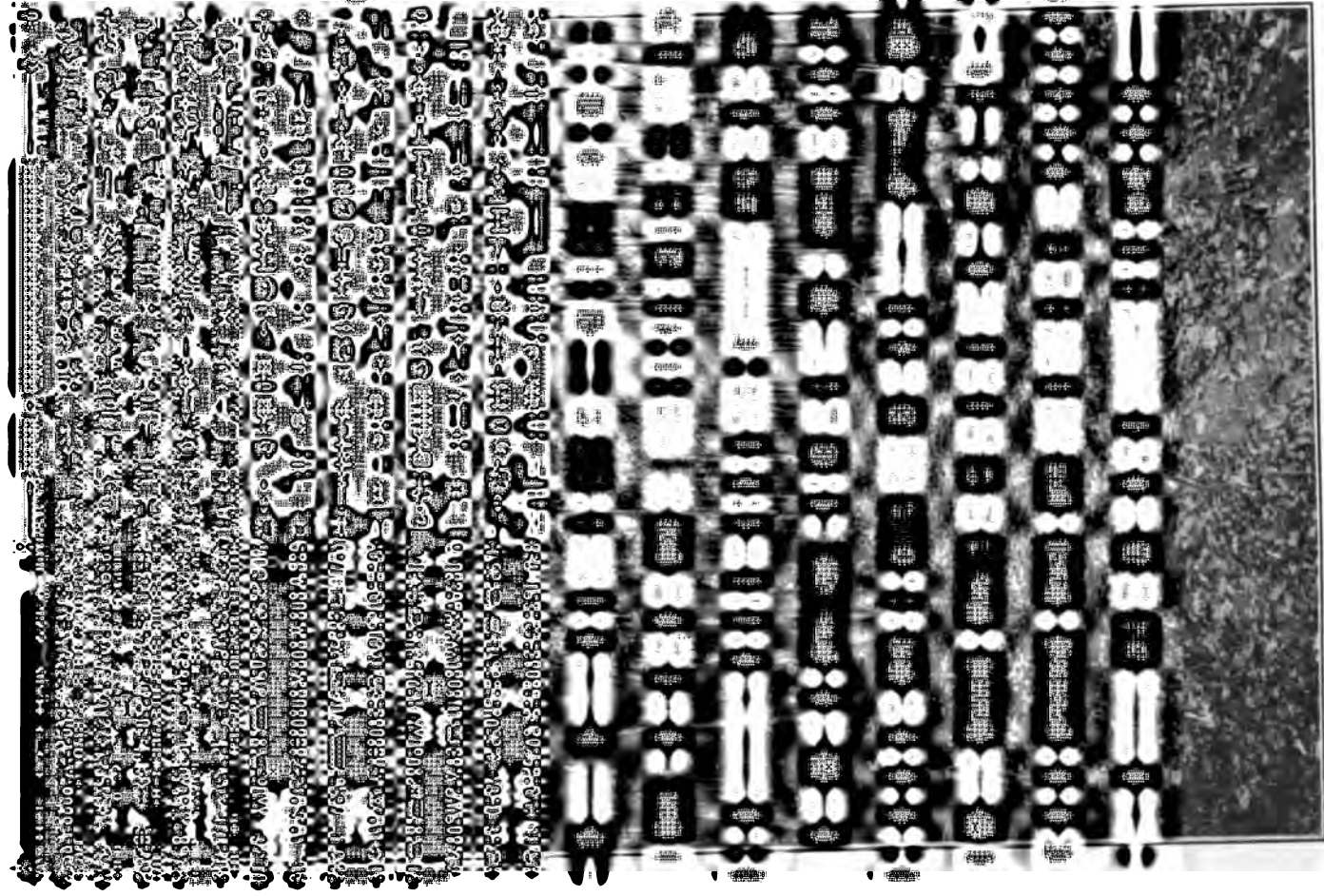






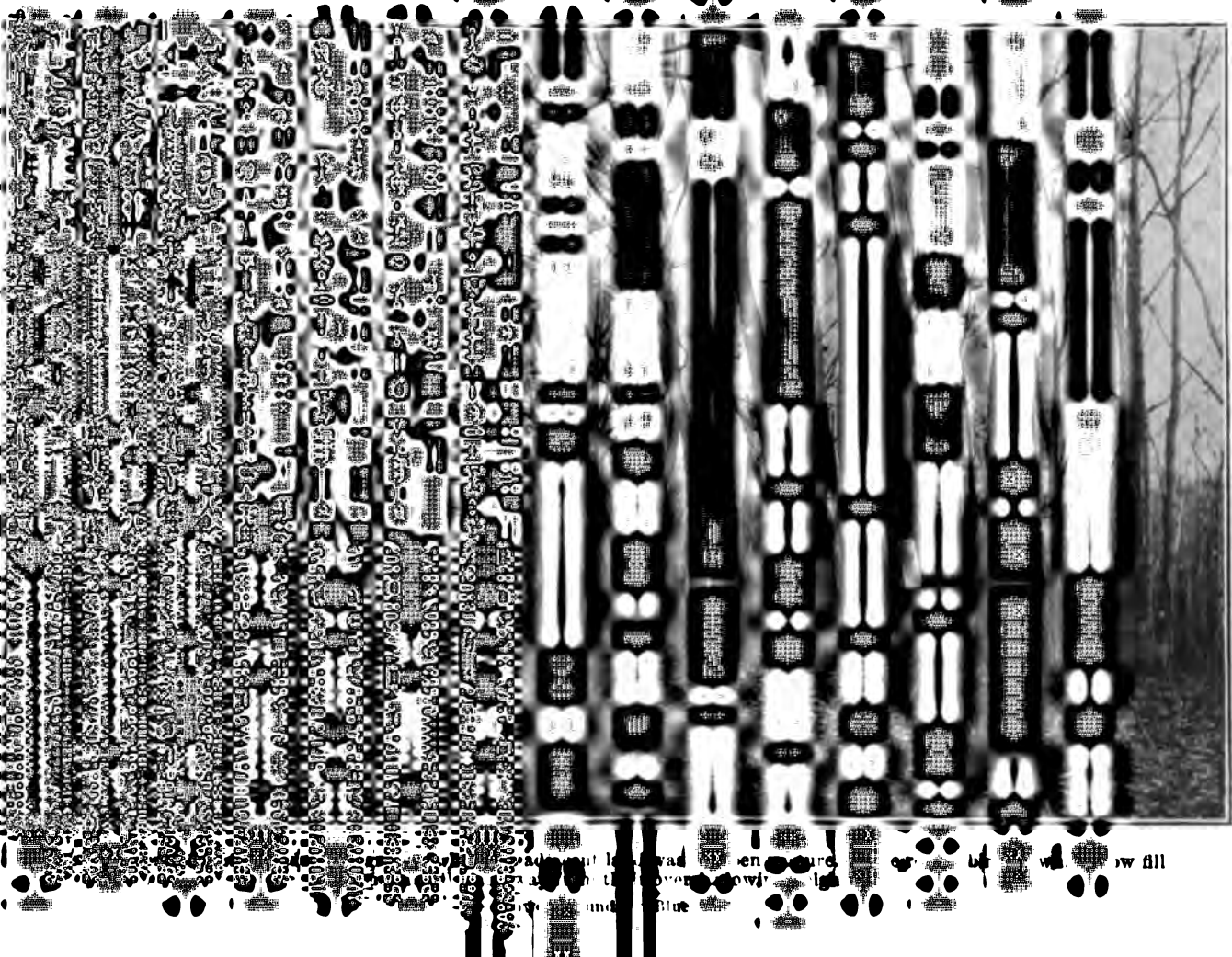


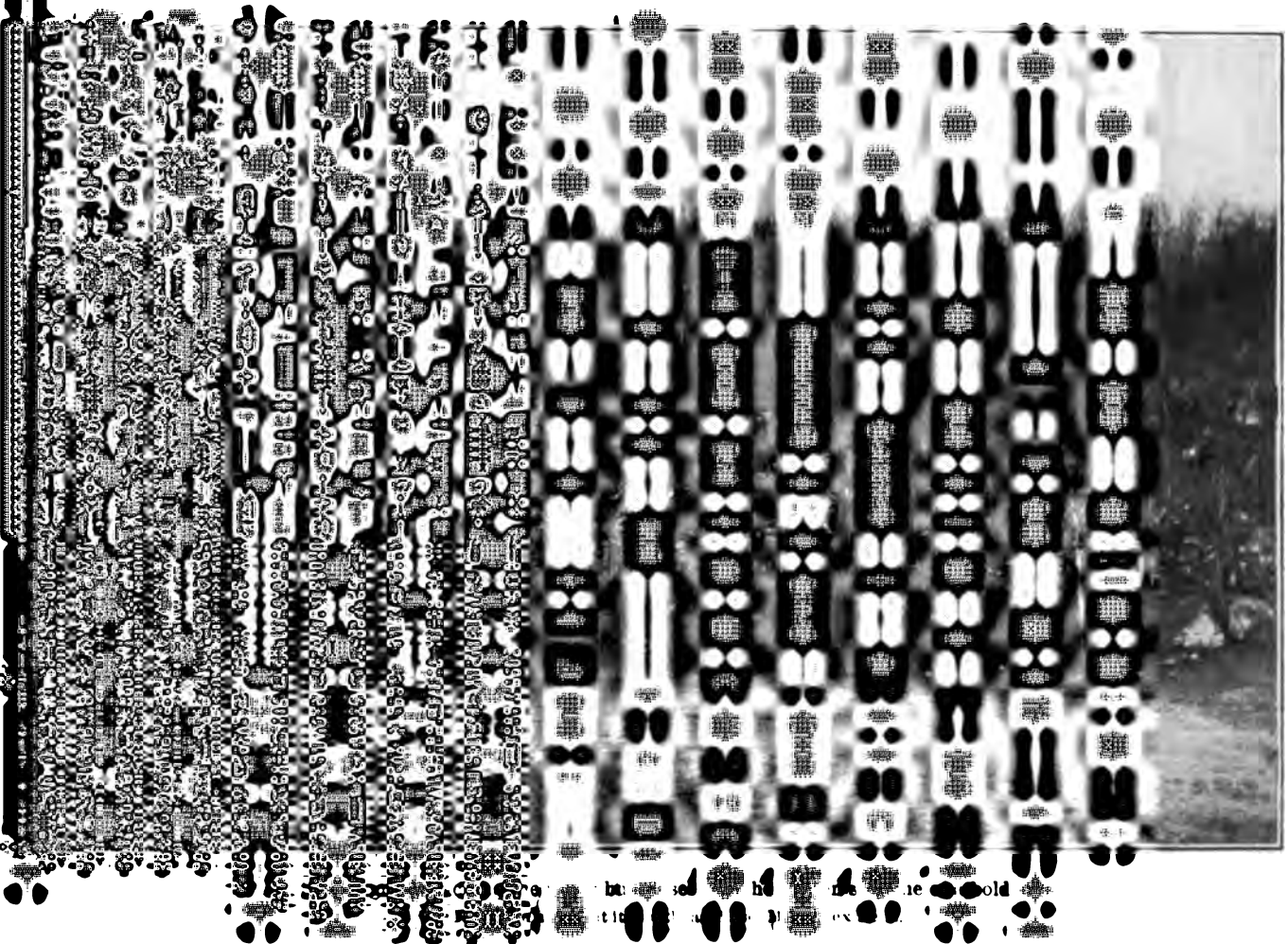
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13. A path leading through sprout-growth or coppice.
Blue Hills.







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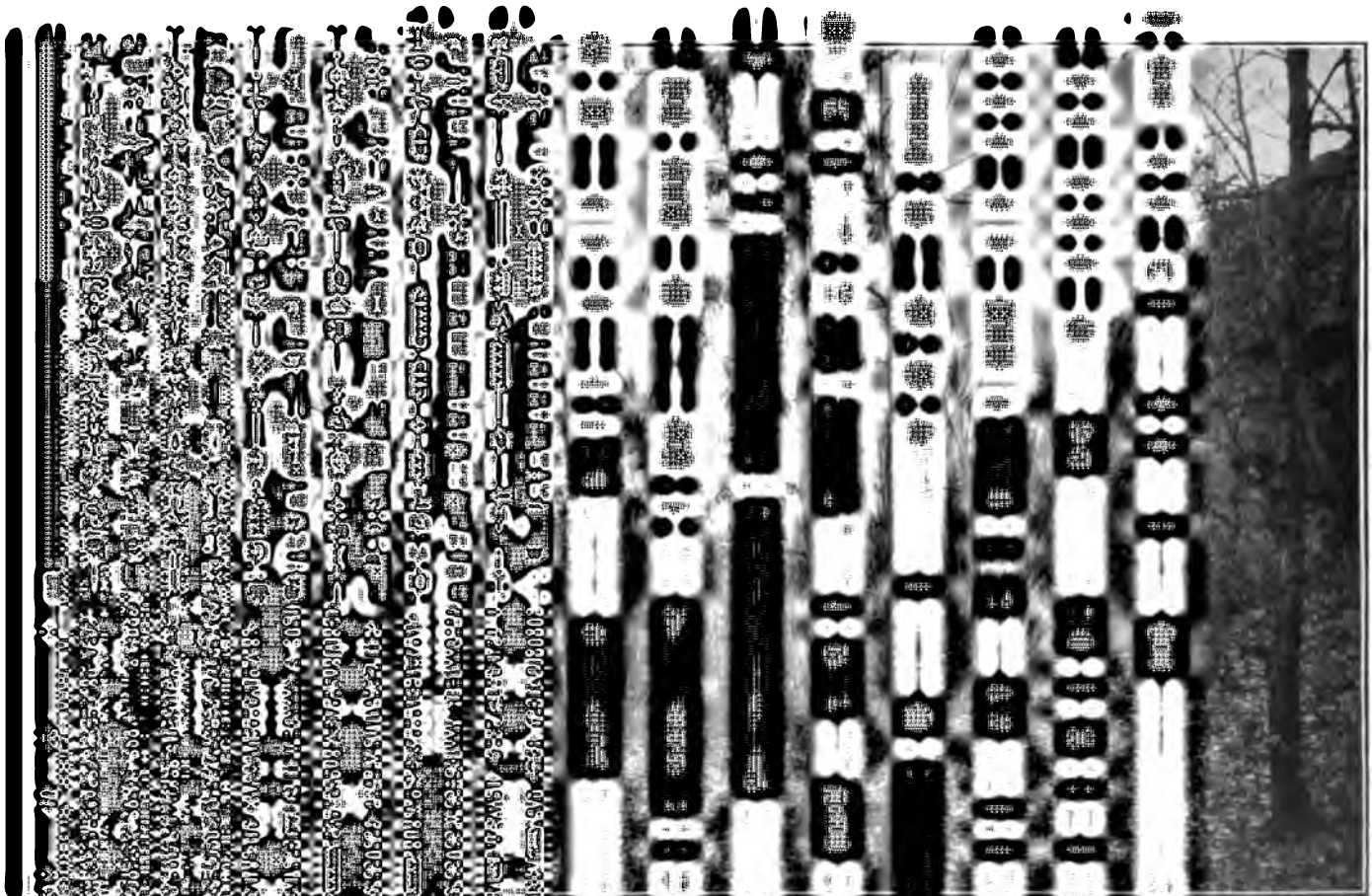
A vertical strip of 15 small, square, black and white photographs. The images show various views of a person's face and head, likely a forensic or medical examination. The top image shows a full face, while subsequent images show close-ups of the eyes, nose, mouth, and other facial features. The bottom image shows a full face again, possibly a different angle or a different person. The images are arranged in a vertical column, with some showing the person's head tilted or turned.

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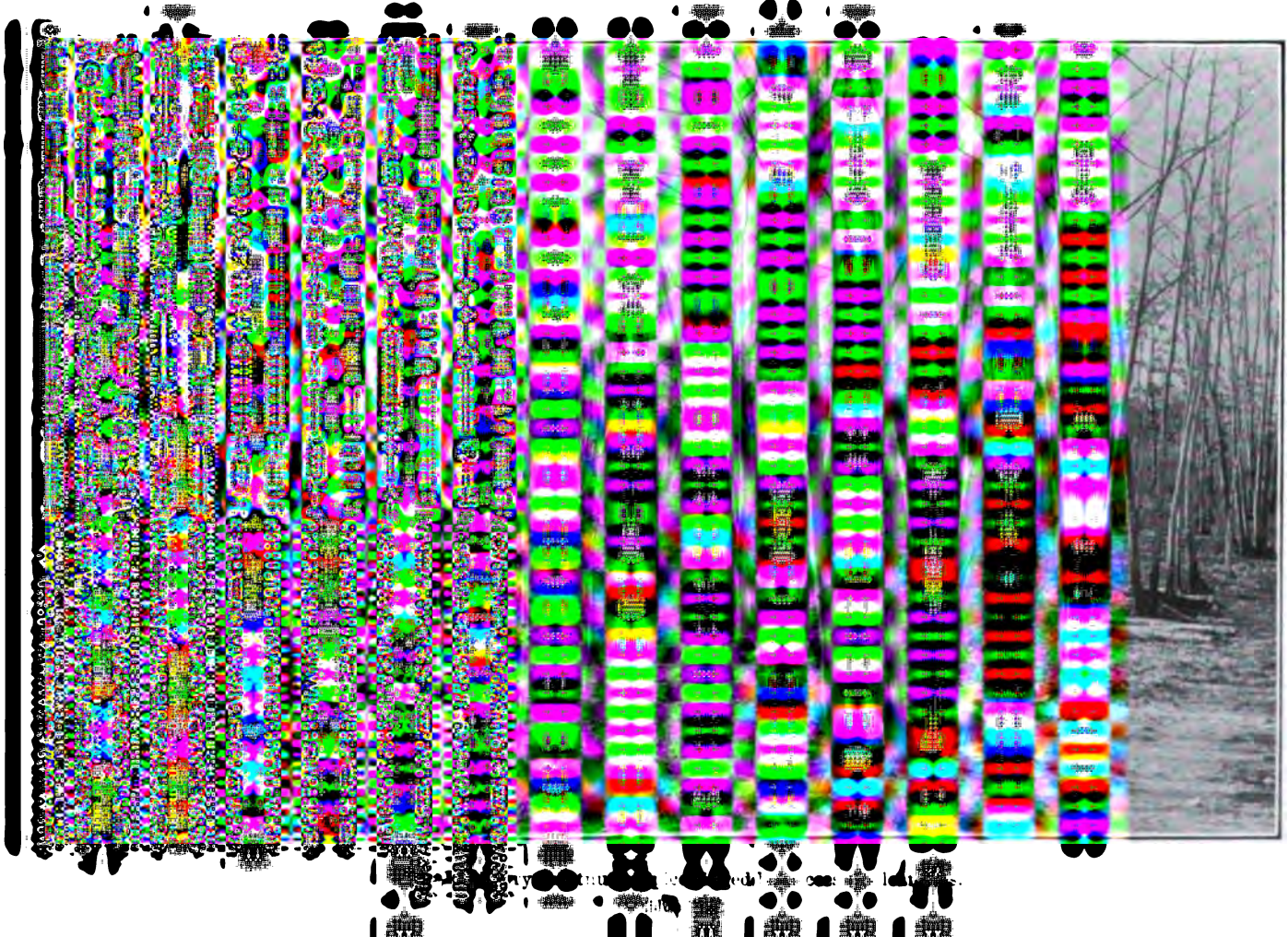
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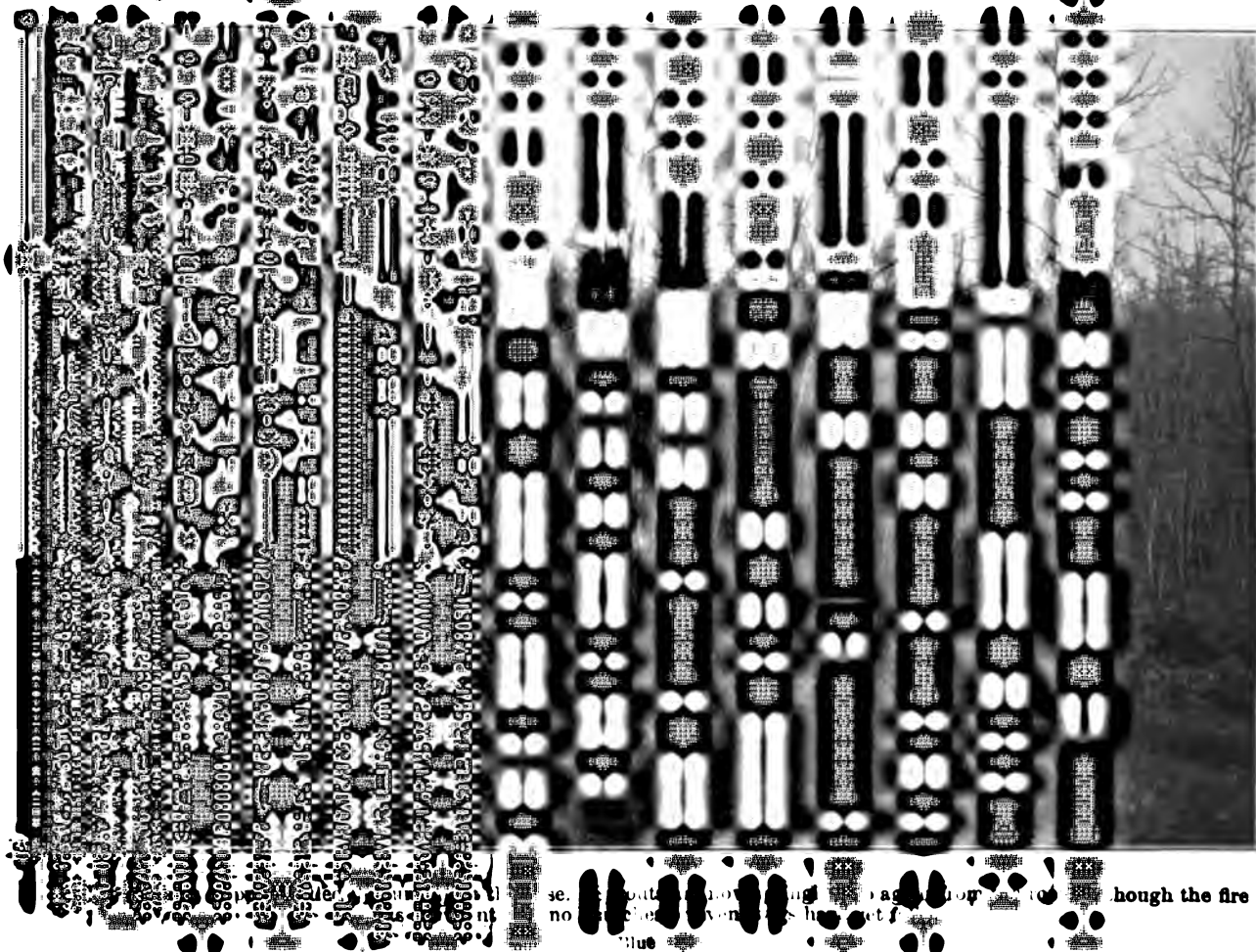


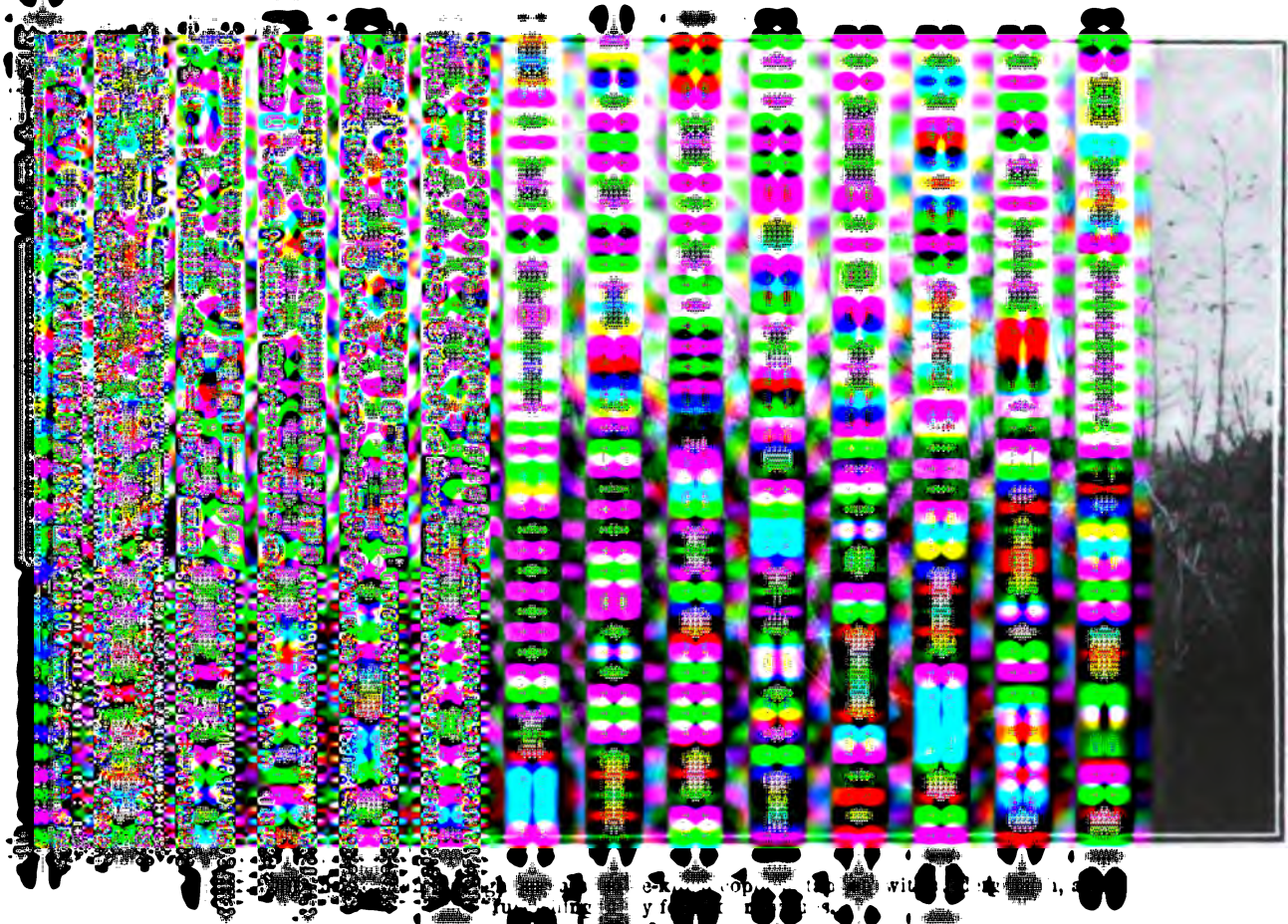
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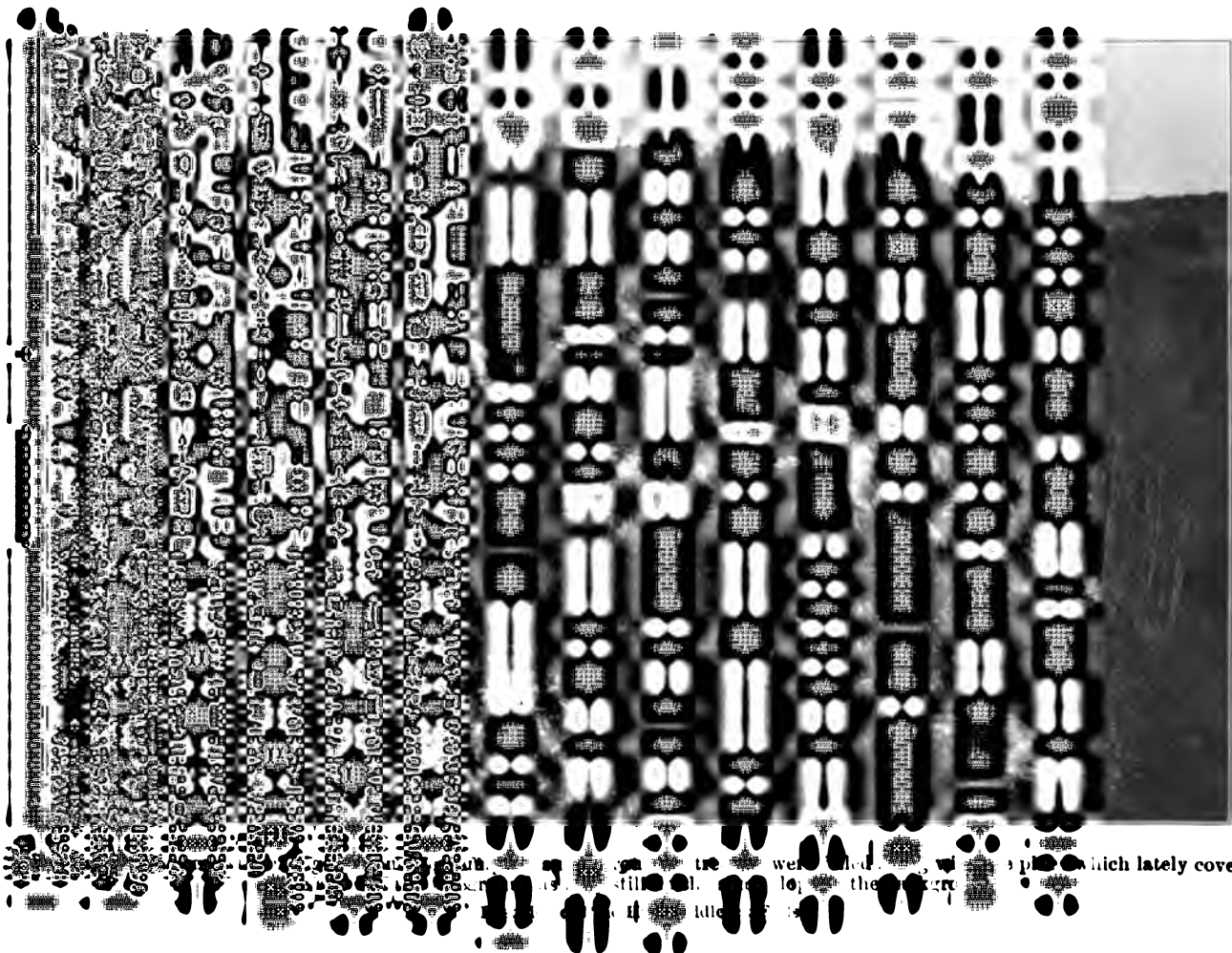








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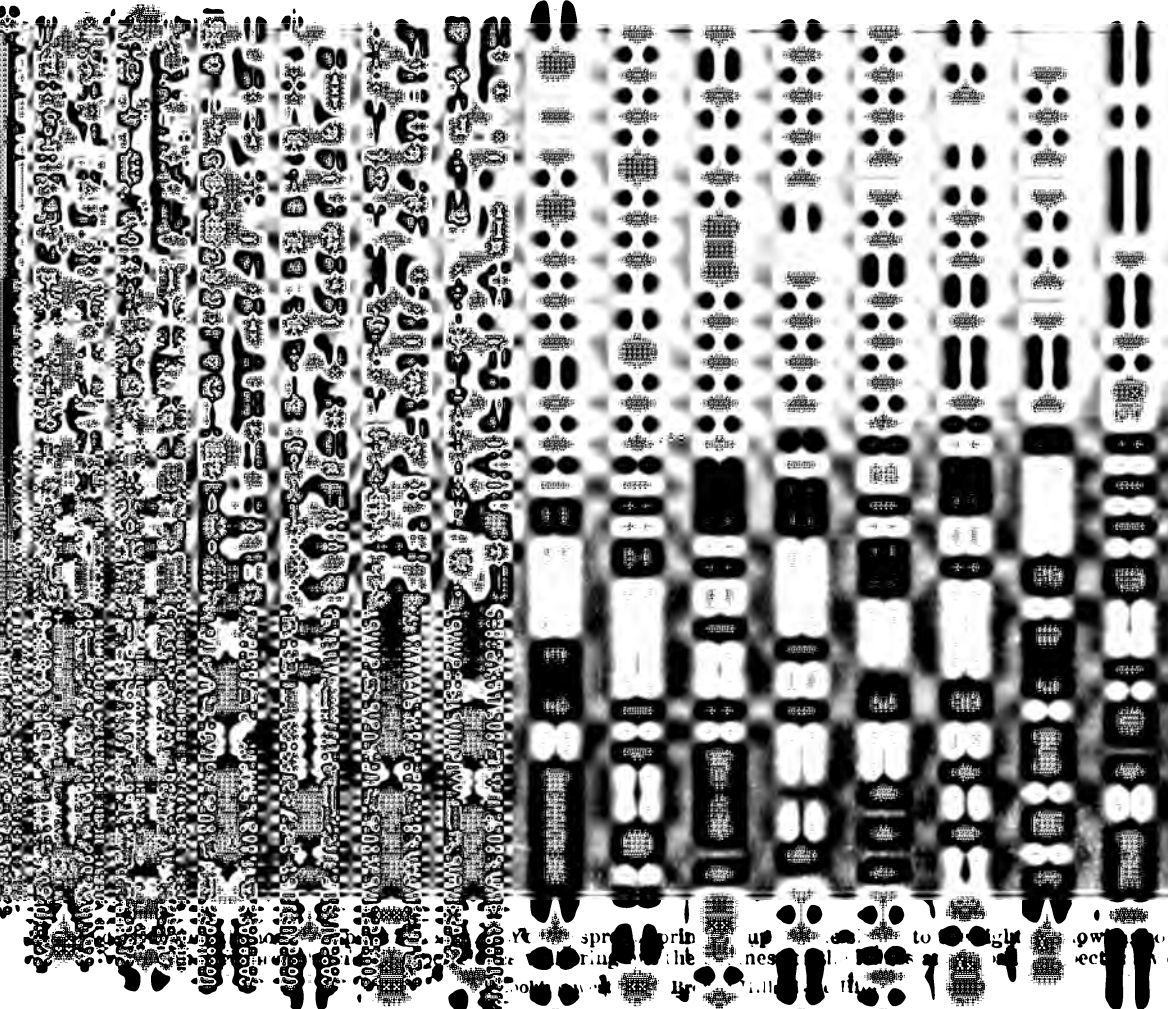
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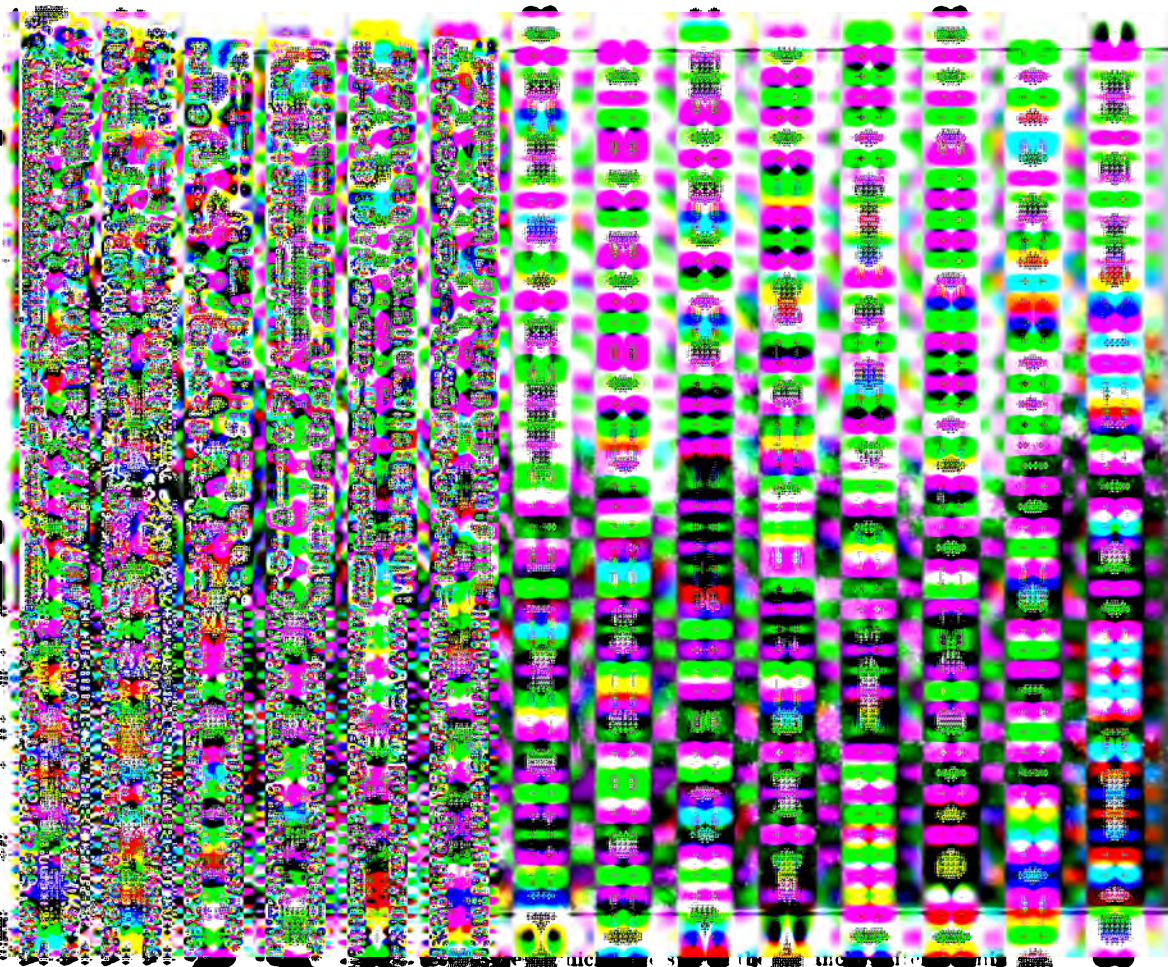


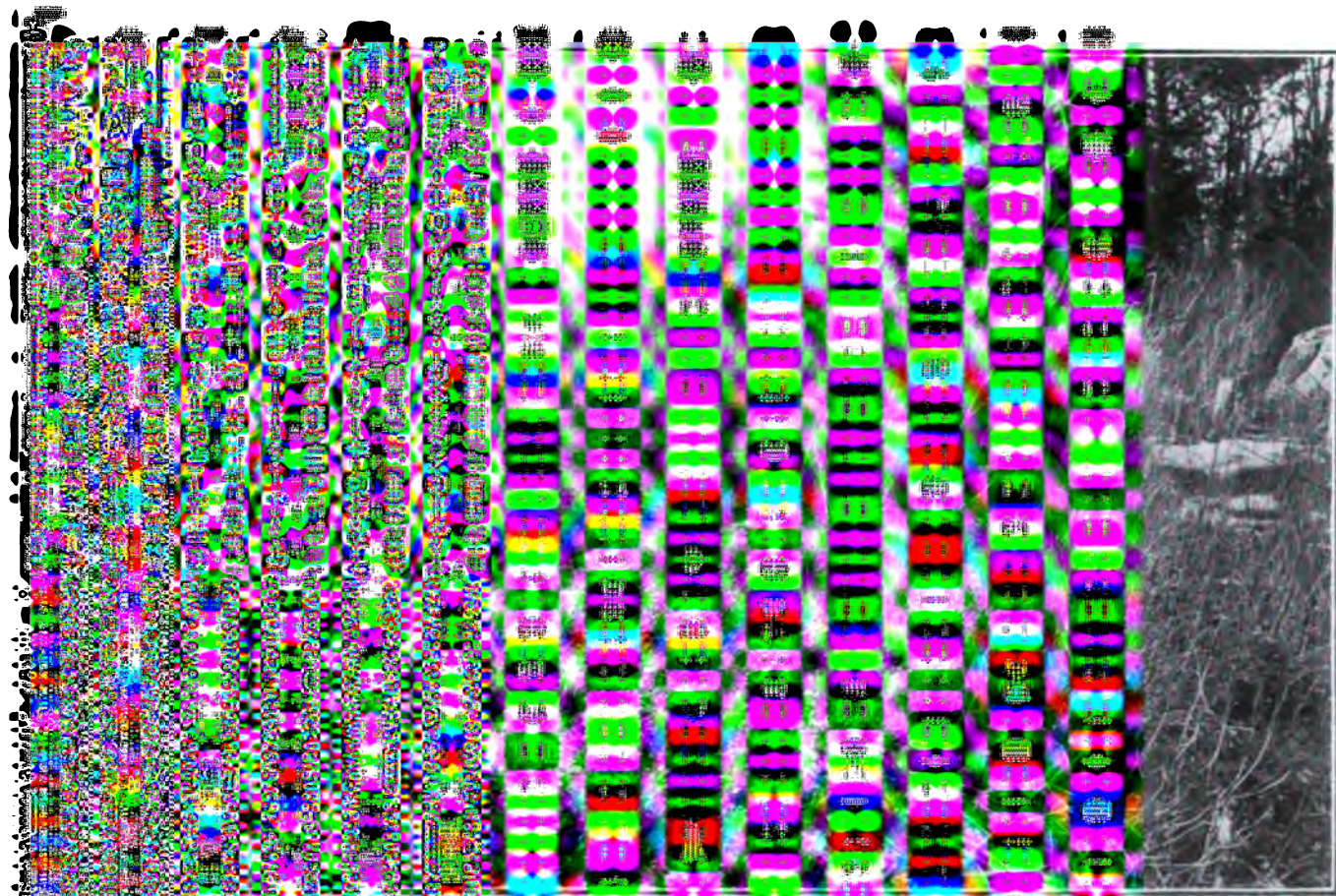


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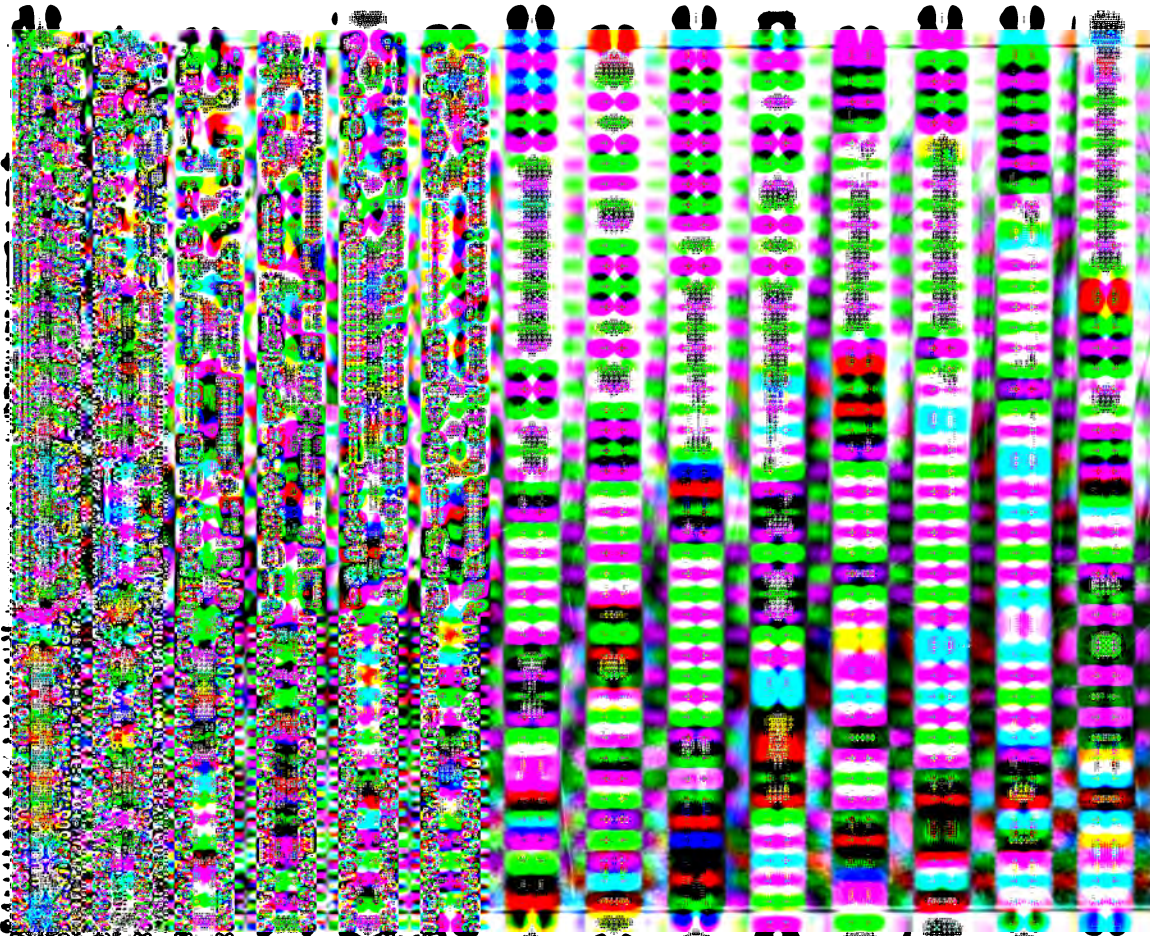
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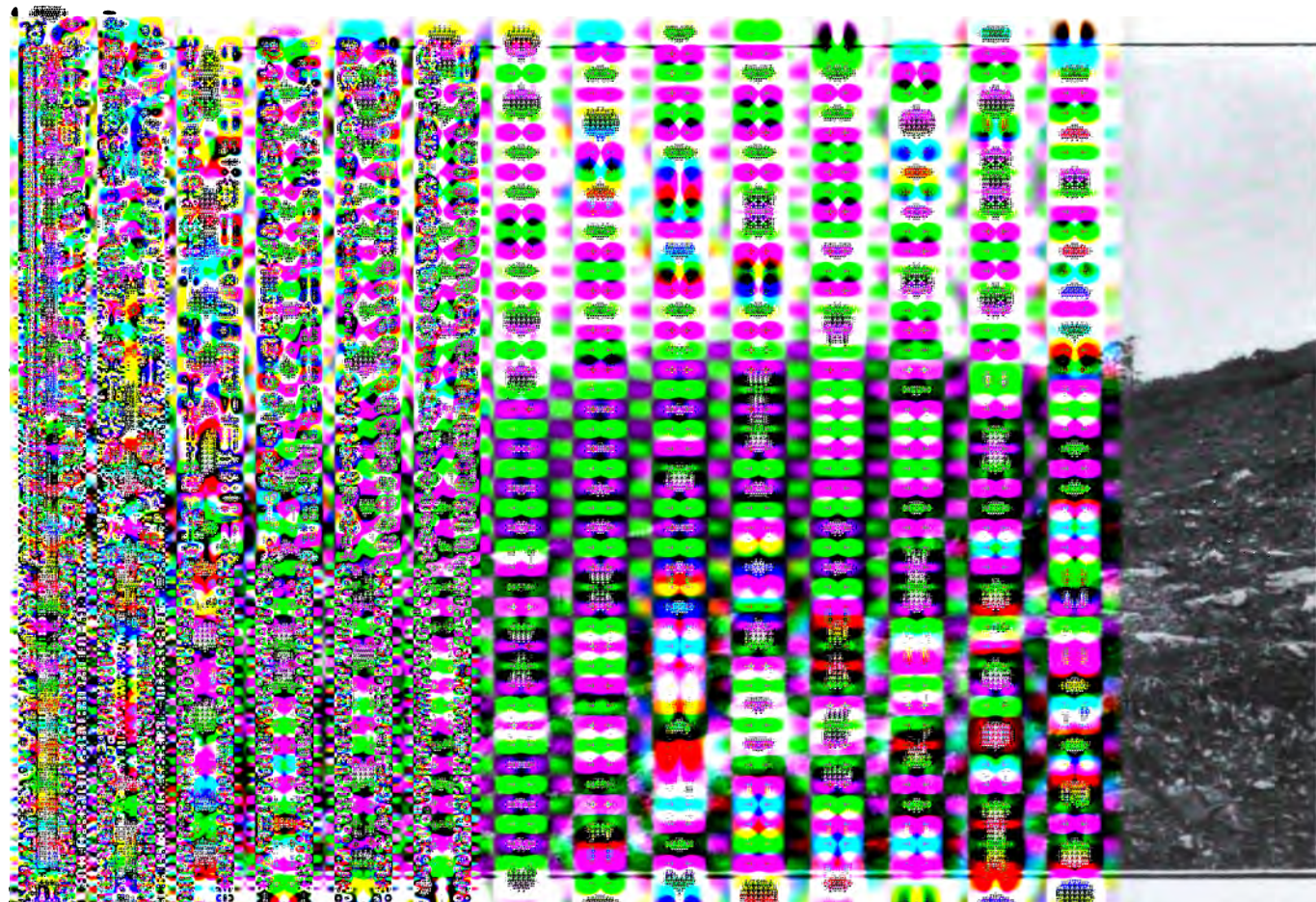




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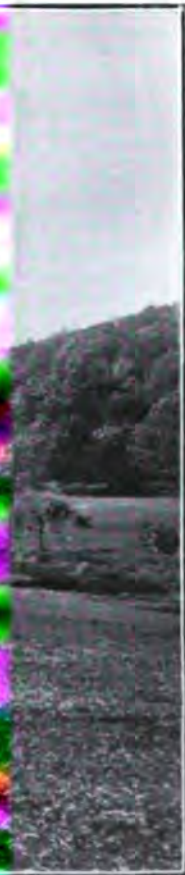
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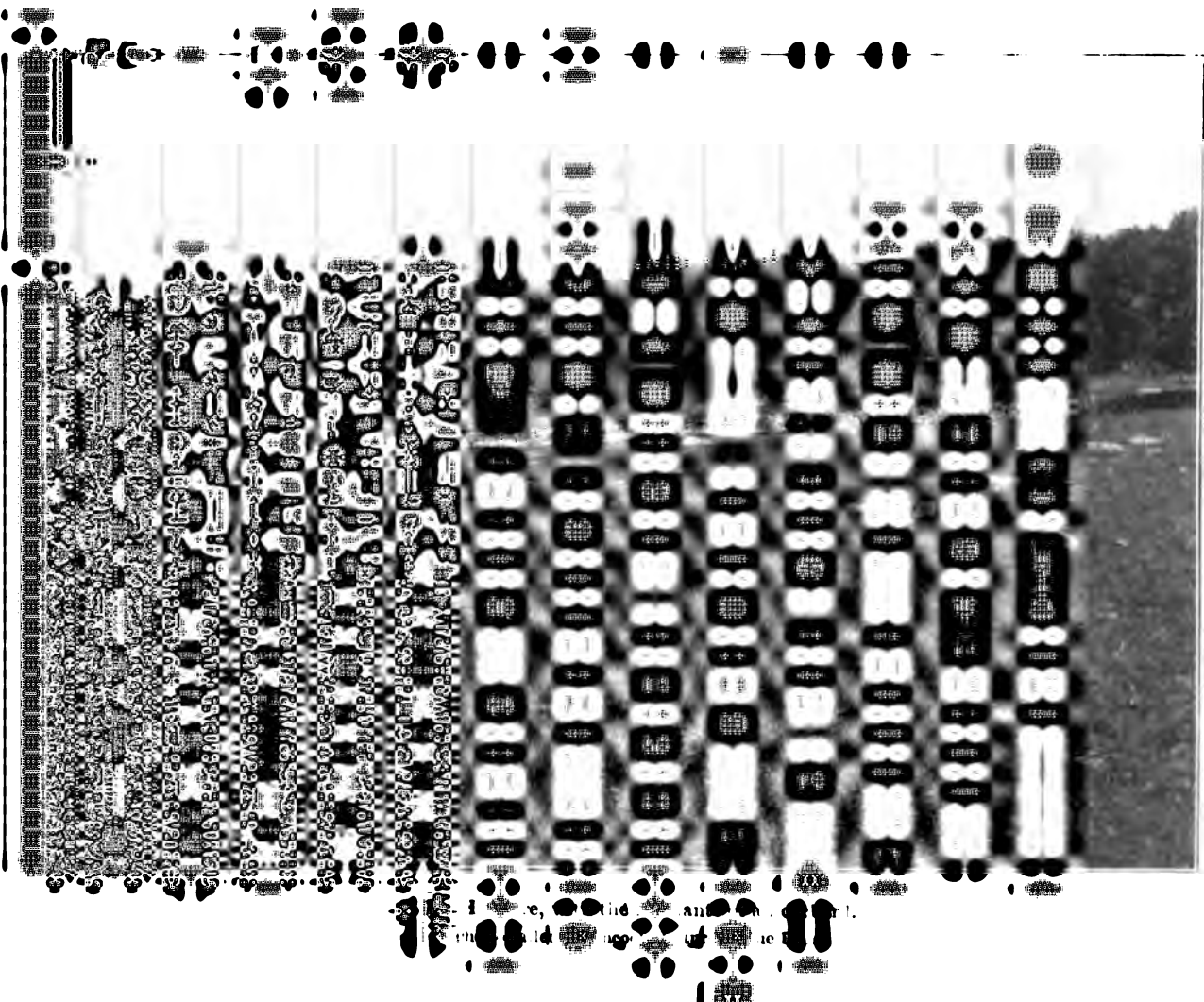


planning, and management of the project. The project was completed on time and within budget. The project was a success.

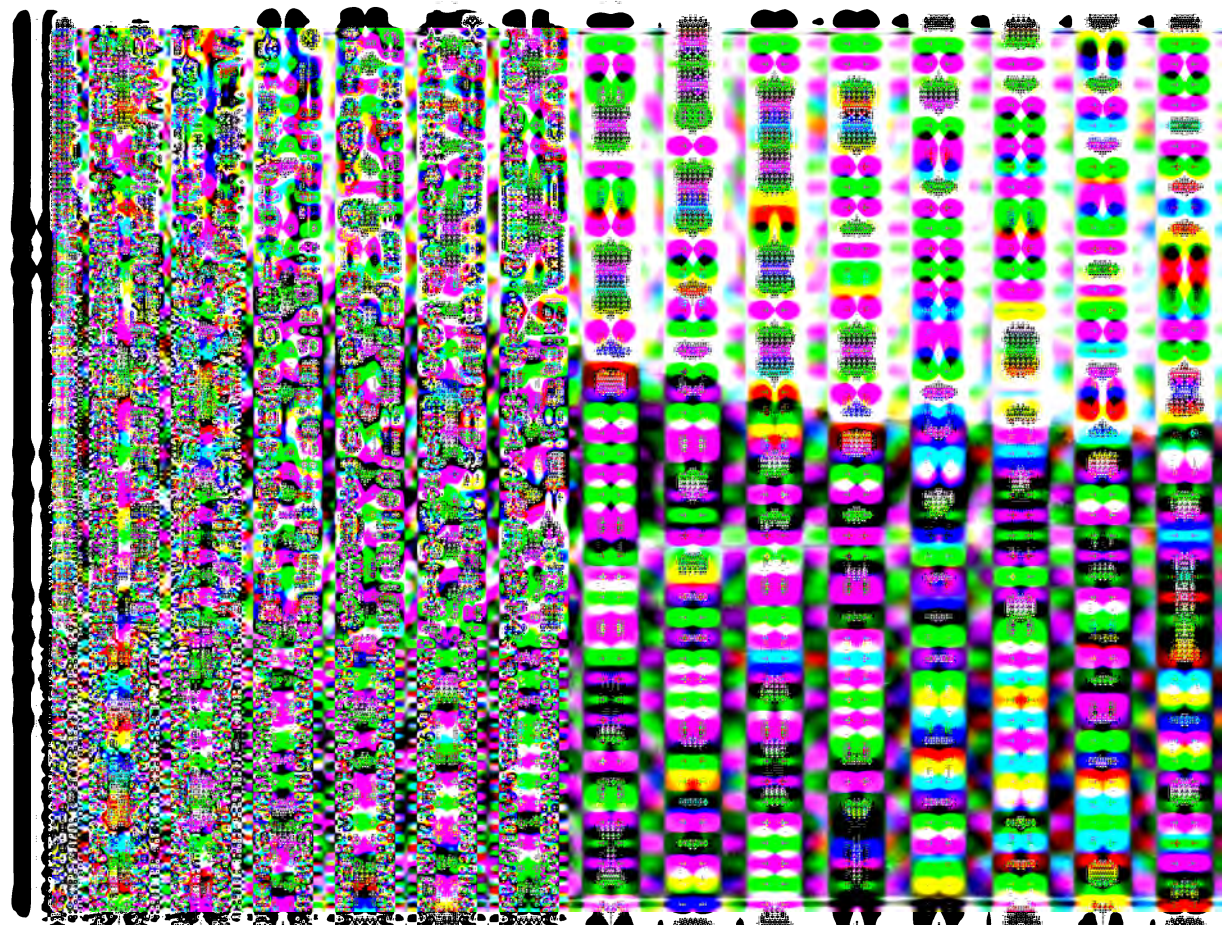
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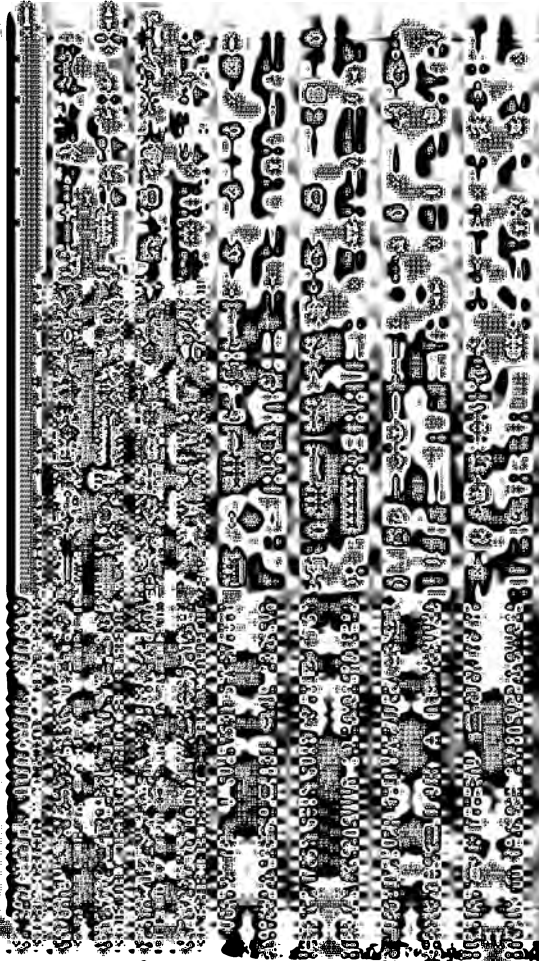
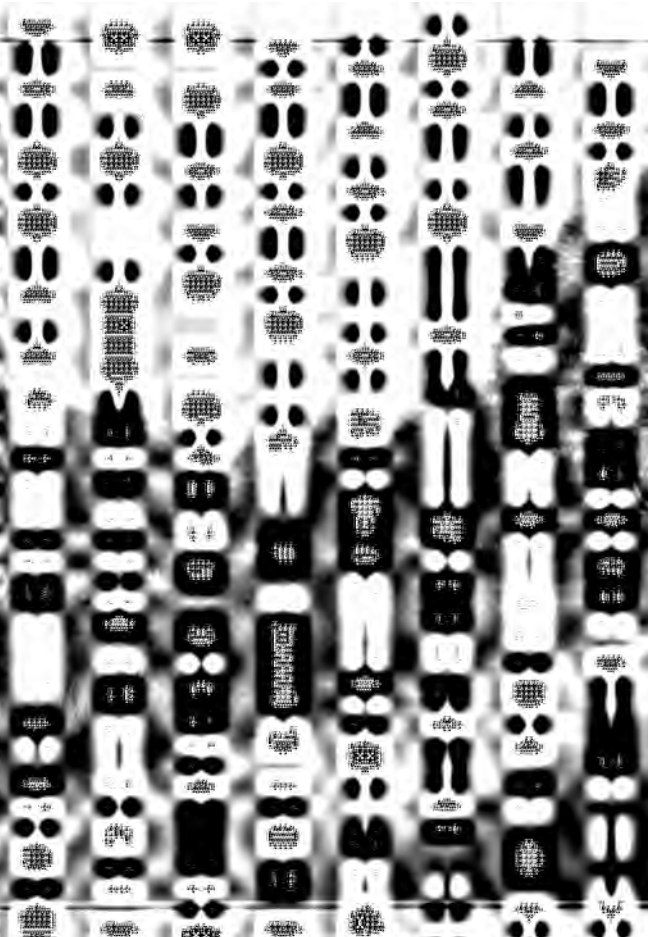




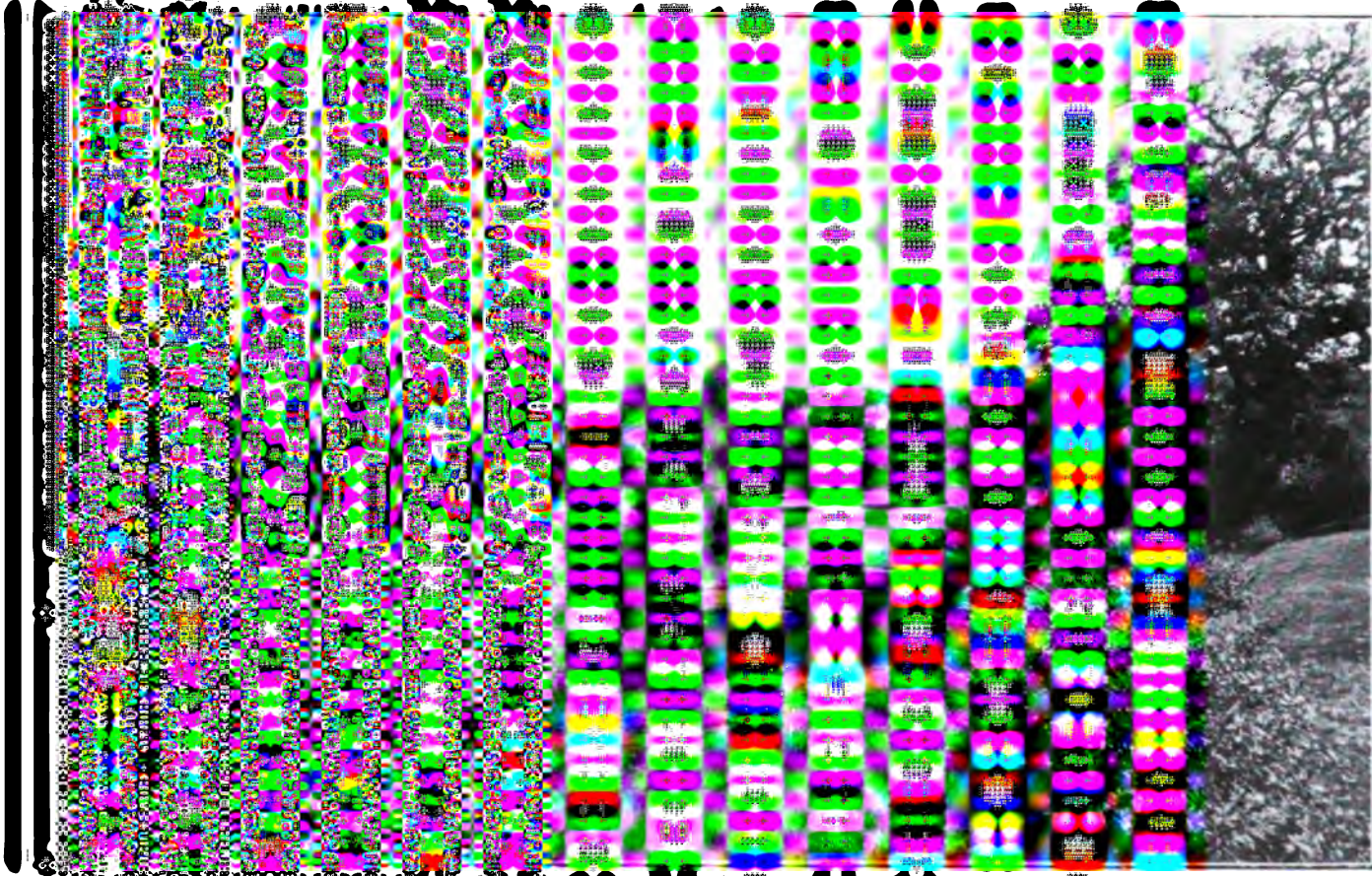


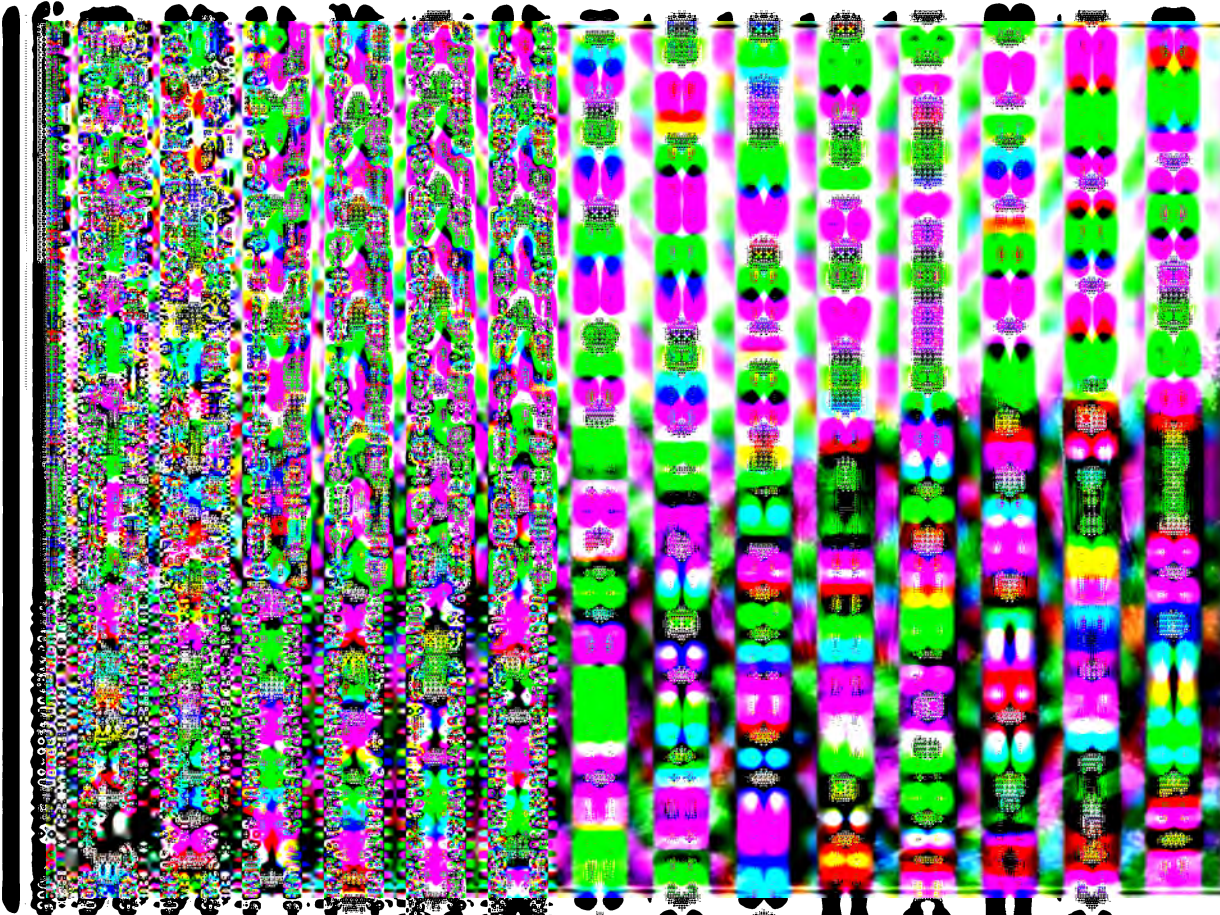
vin... sw... dra... by... ing... lib... t... and stones,
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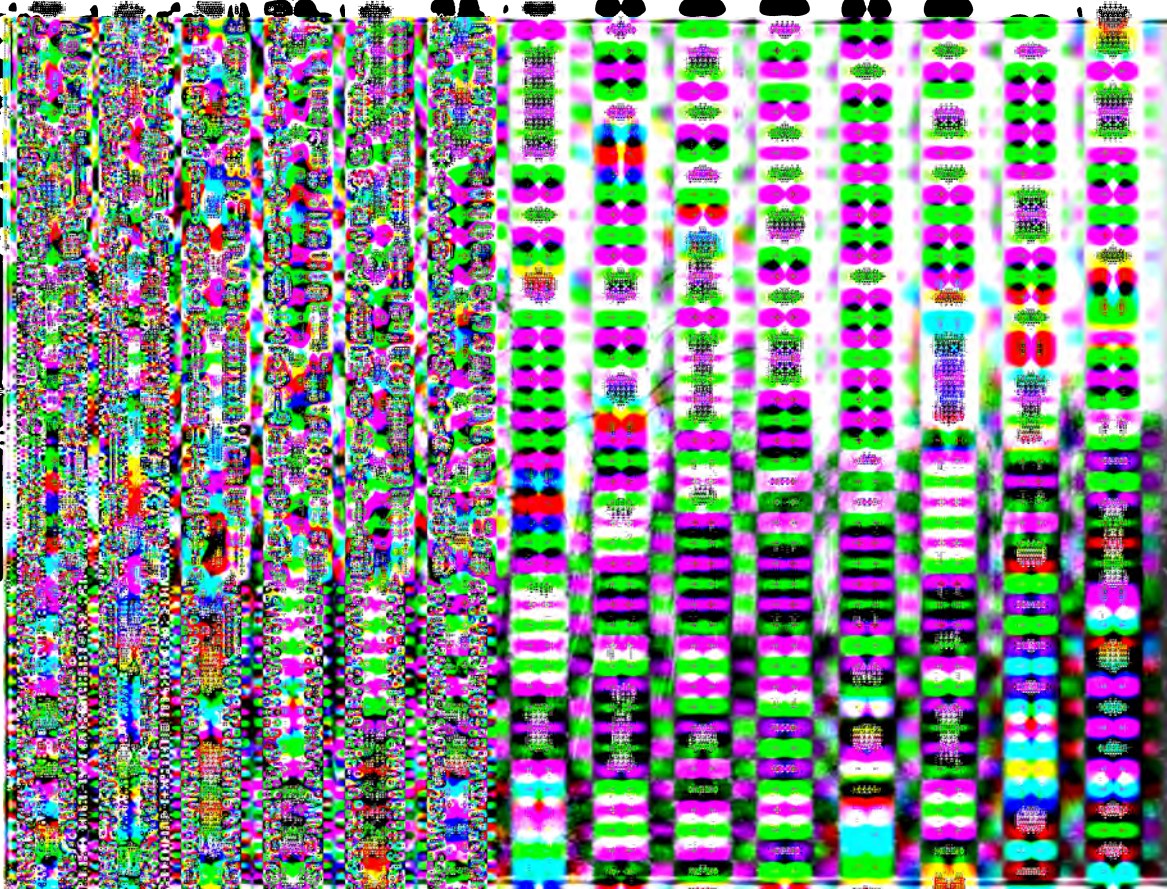
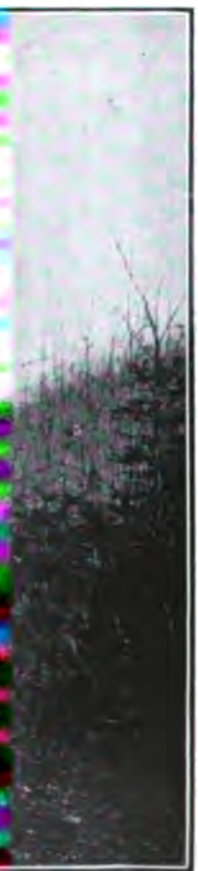


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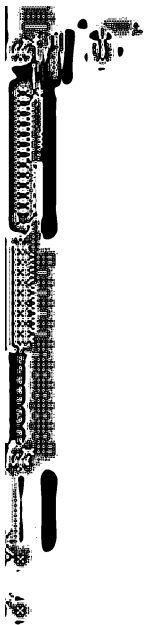
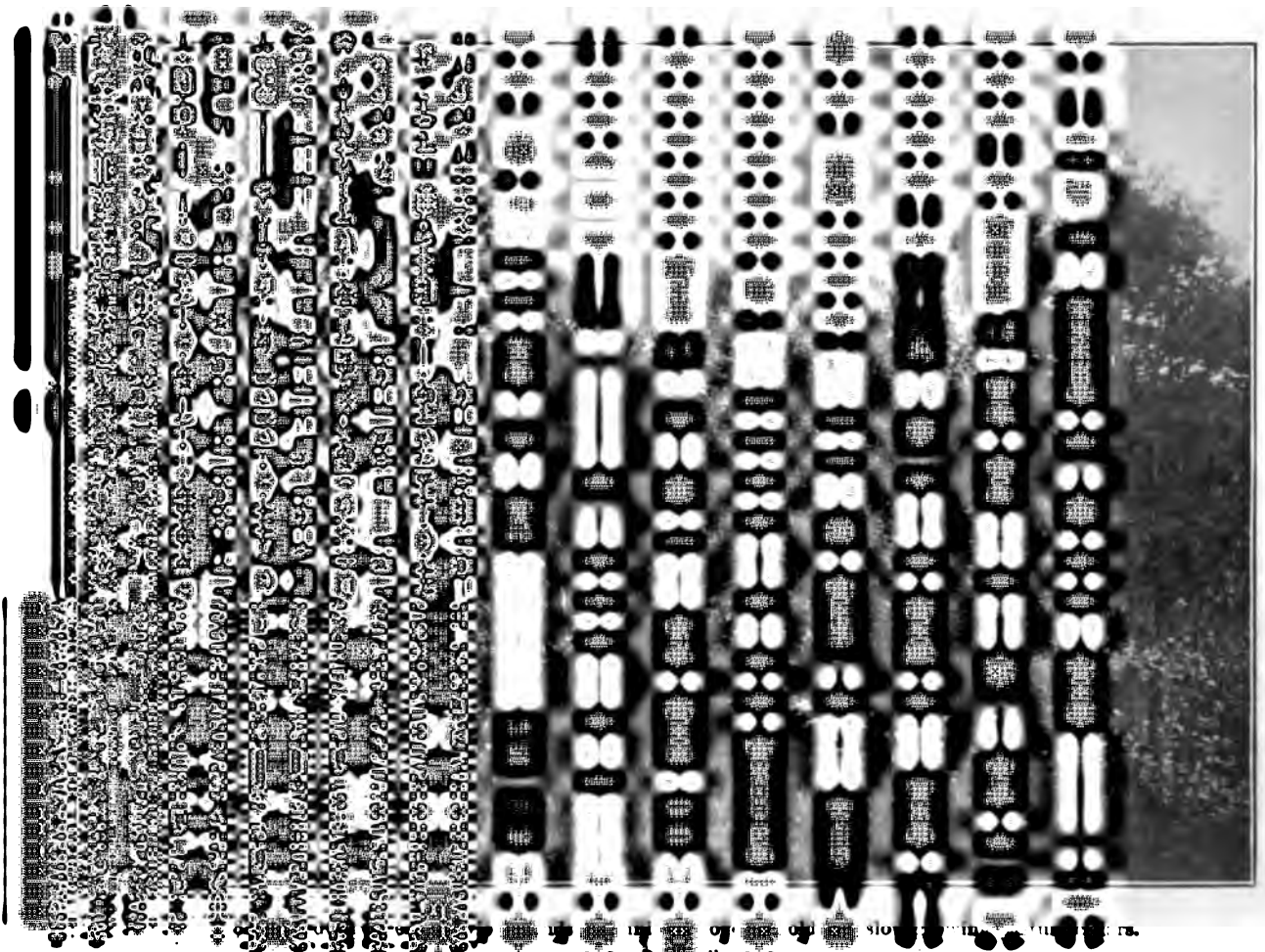


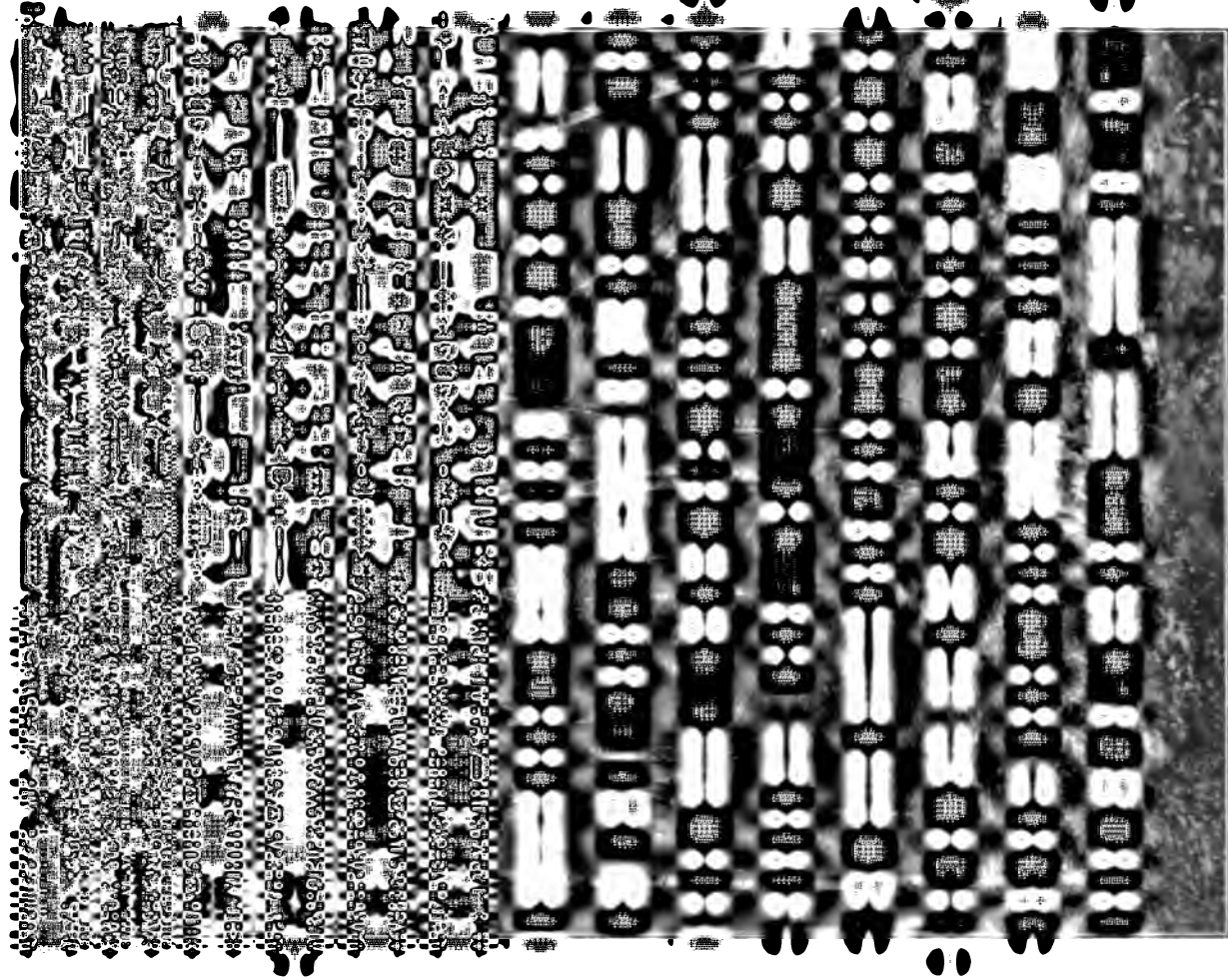
THE
FEDERAL
BUREAU OF
INVESTIGATION
OF THE
DEPARTMENT OF JUSTICE
WASHINGTON, D. C. 20535
MEMORANDUM FOR THE DIRECTOR
SUBJECT: [Illegible]
[The following text is extremely faint and largely illegible due to the quality of the scan. It appears to be a multi-paragraph memorandum.]





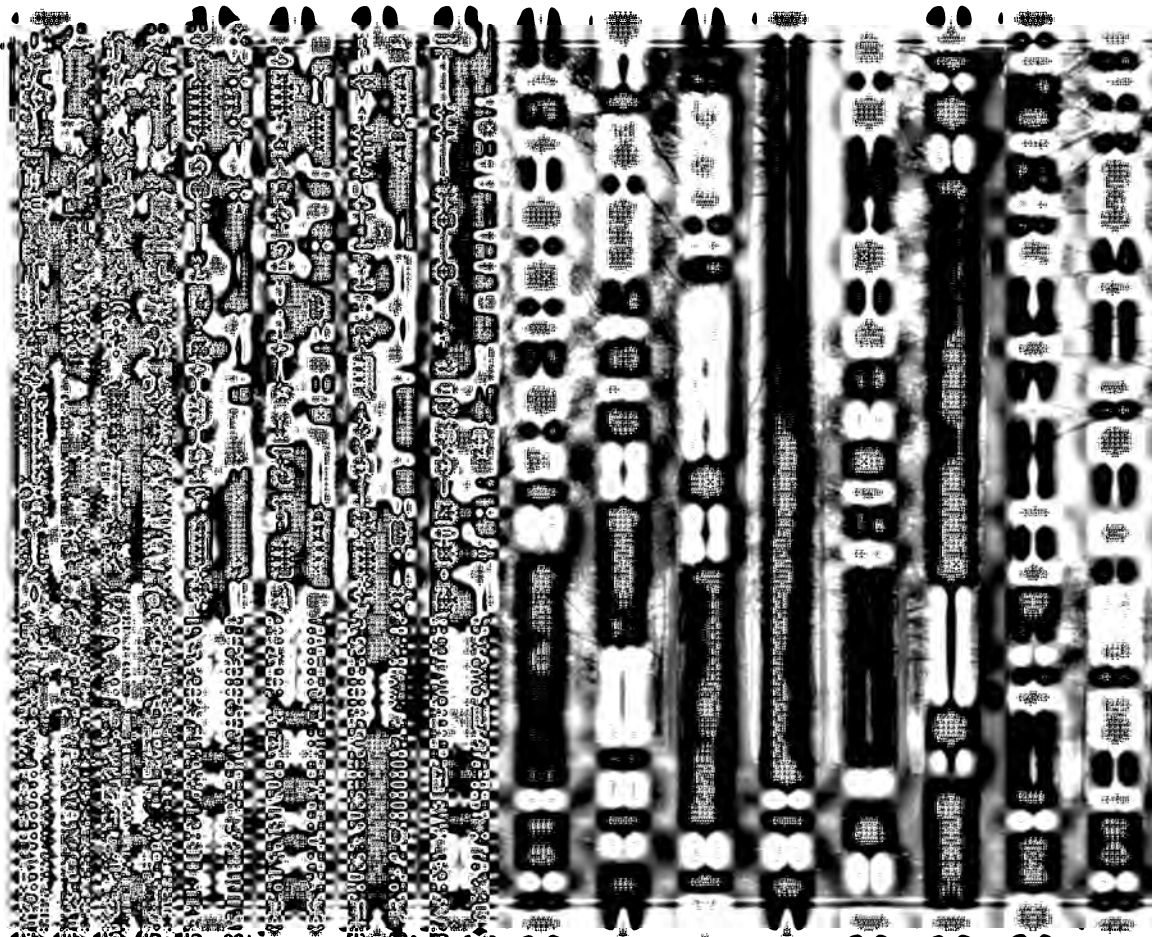
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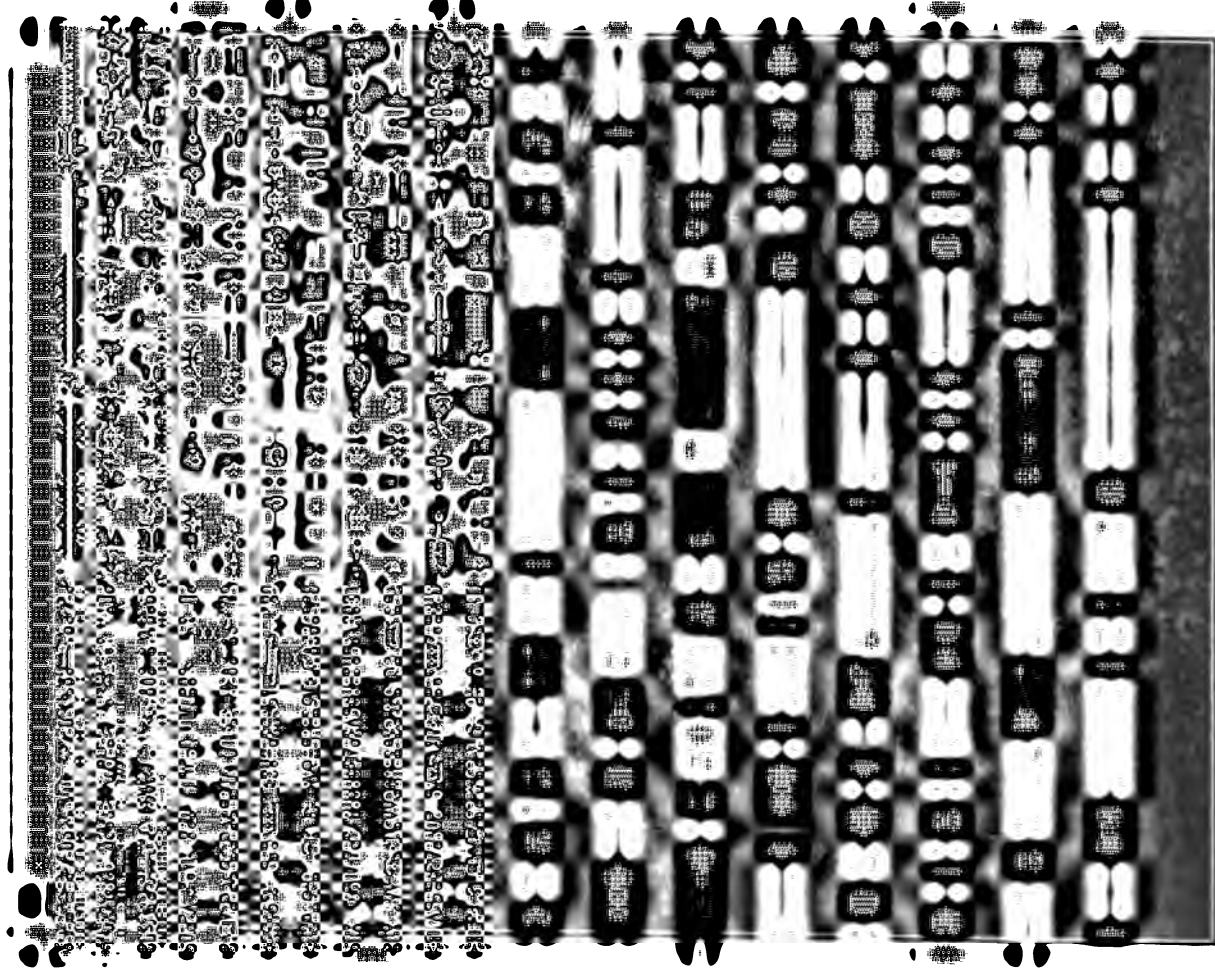




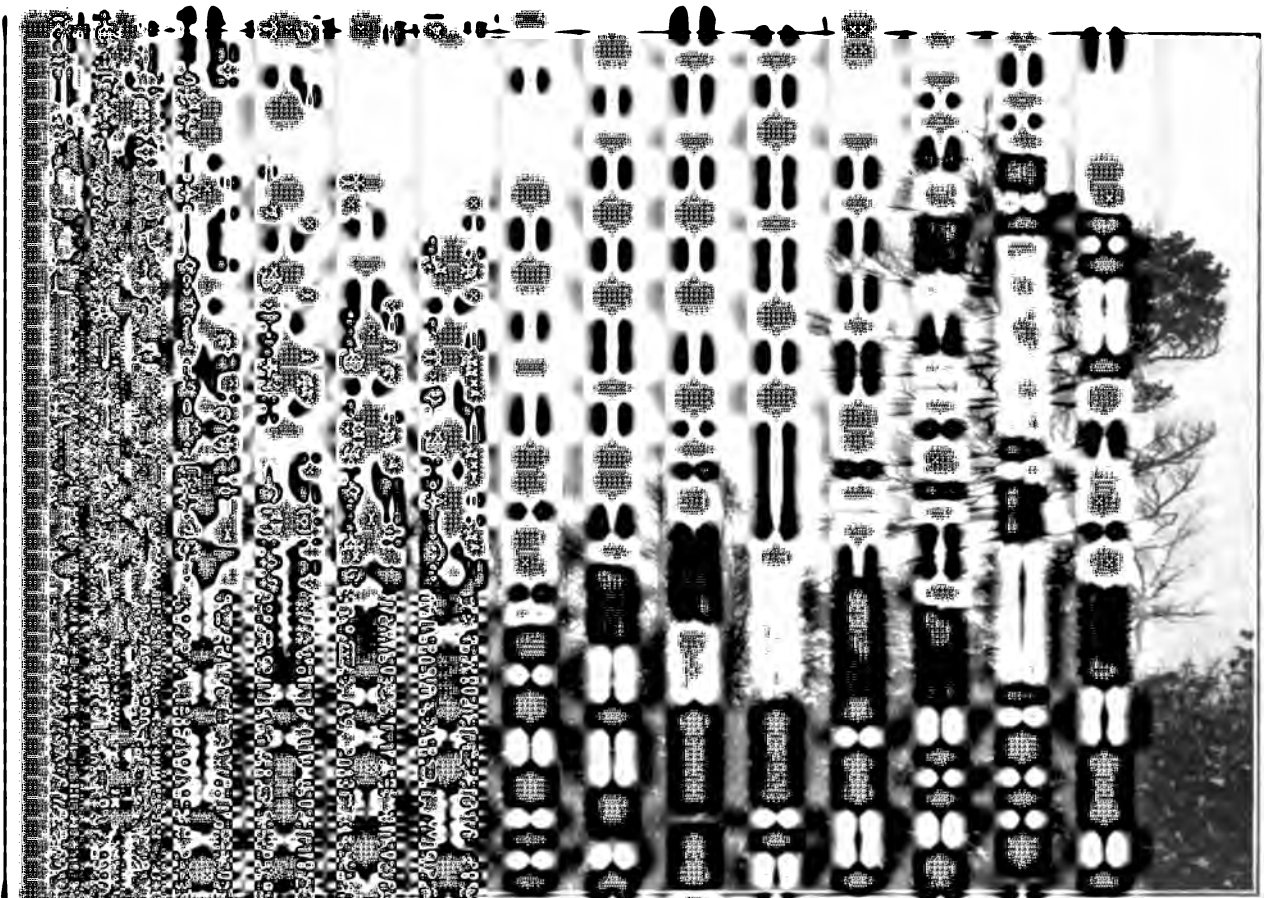
30. Seedling chestnuts overtopping old, thin, and decaying cedars. A few remaining but short-lived birches in foreground.
Blue Hills.



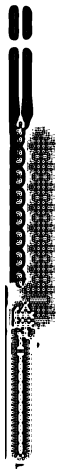
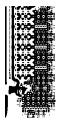


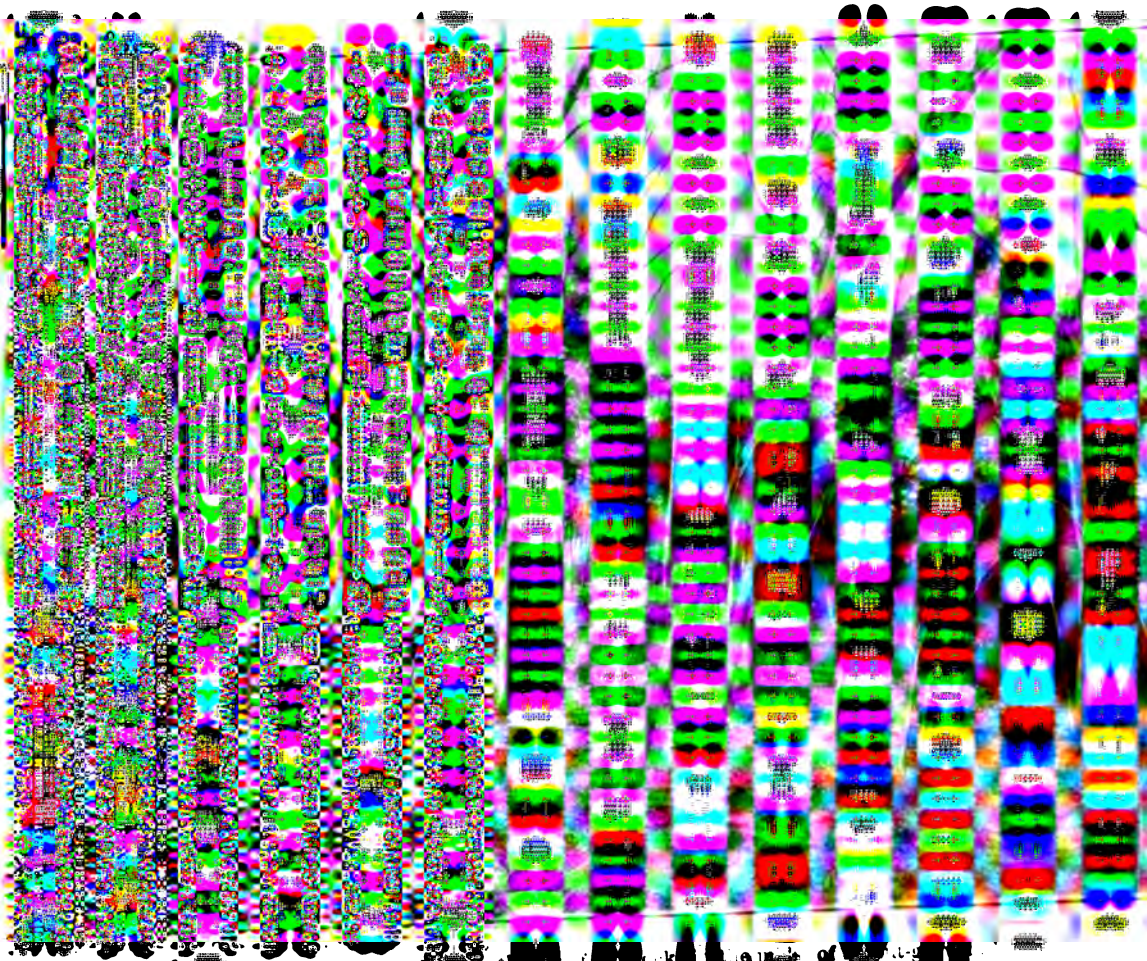


41. Pines which have been given more room to spread in than is usual. In the distance all undergrowth is kept down in favor of grass.
 Wolcott Pines, the border of Gov. Wolcott's estate, Nine Hills.

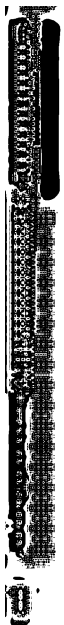
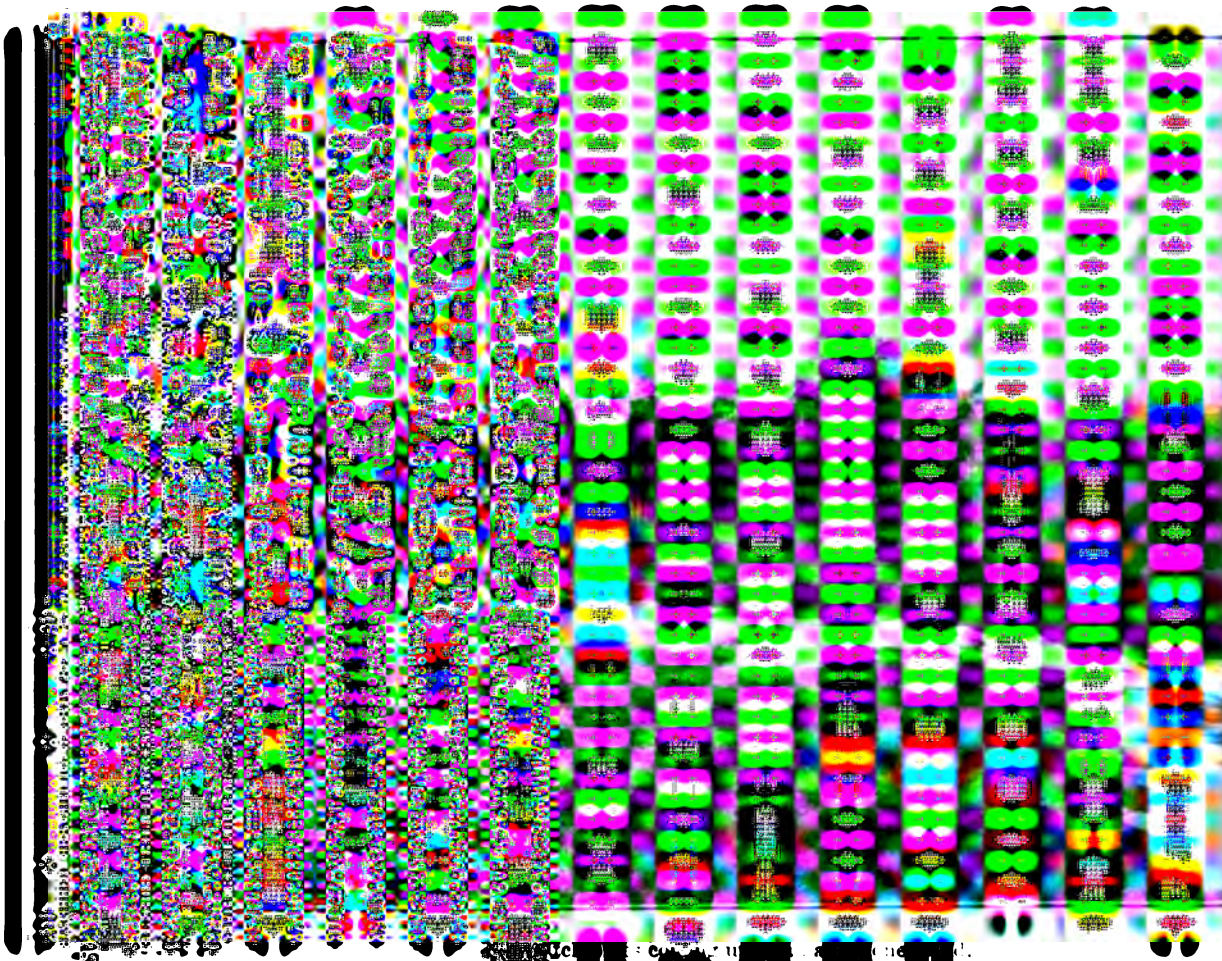


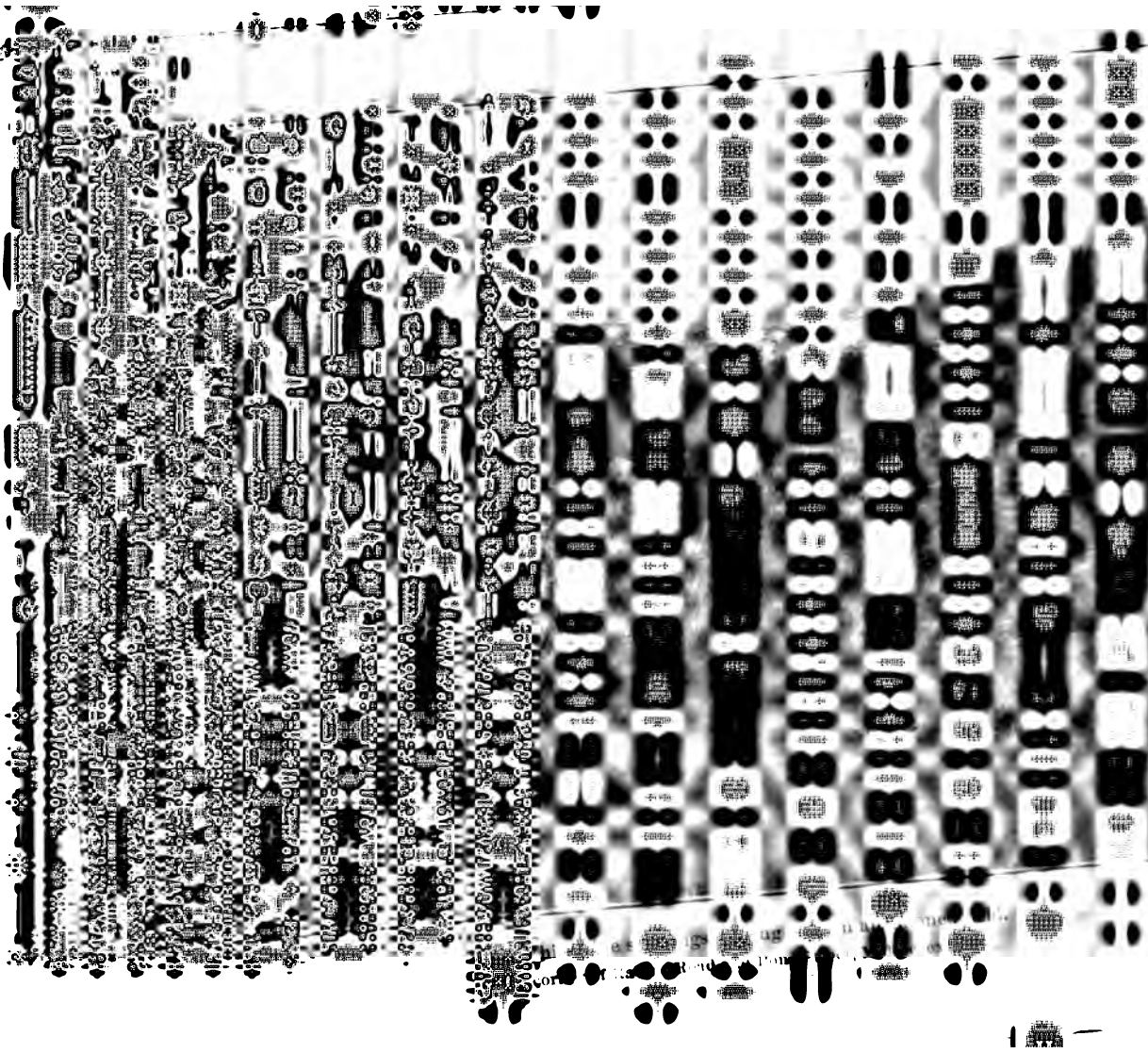
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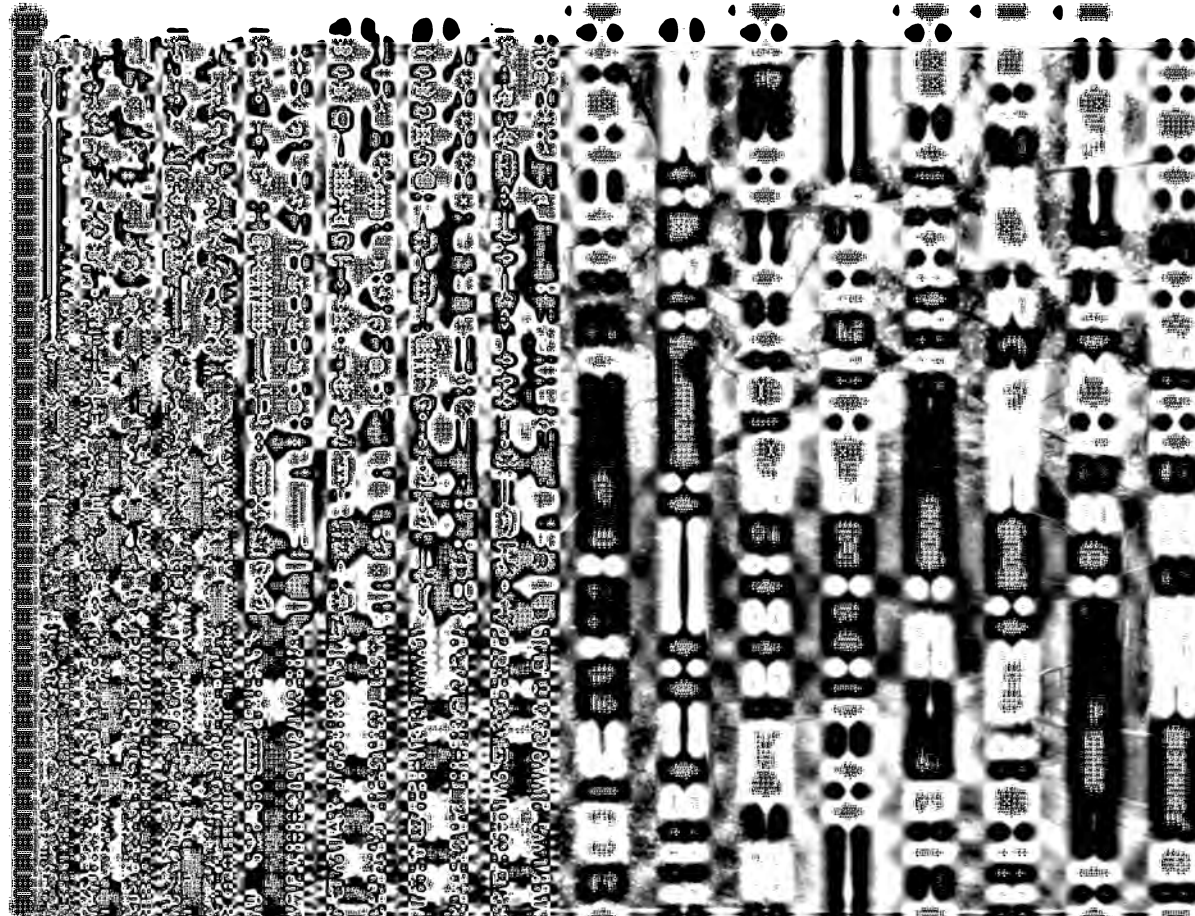




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BRITAIN
AND IRELAND
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LXXV
PART I
1945

Published by the Royal Anthropological Institute of Great Britain and Ireland
21, BEDFORD SQUARE, LONDON, W.C.2

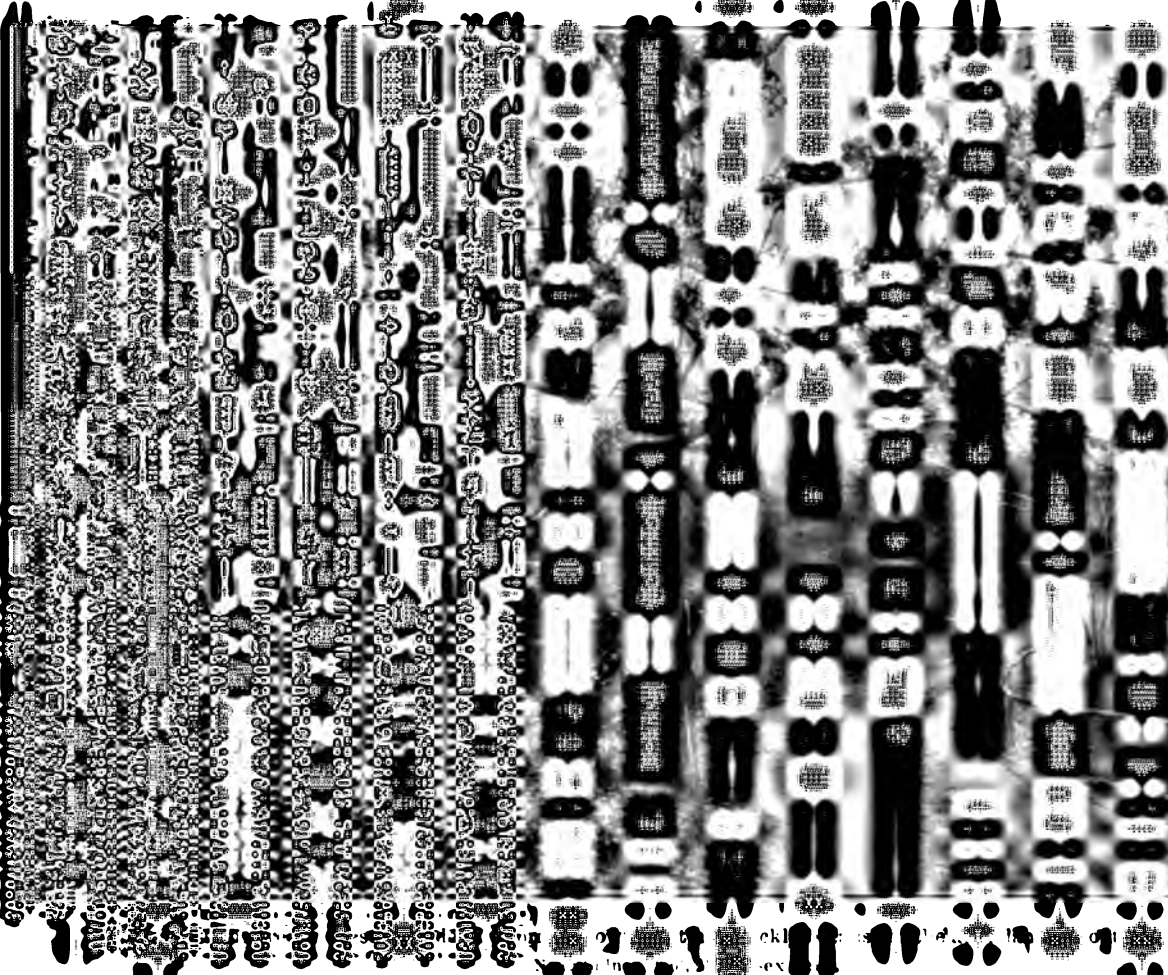




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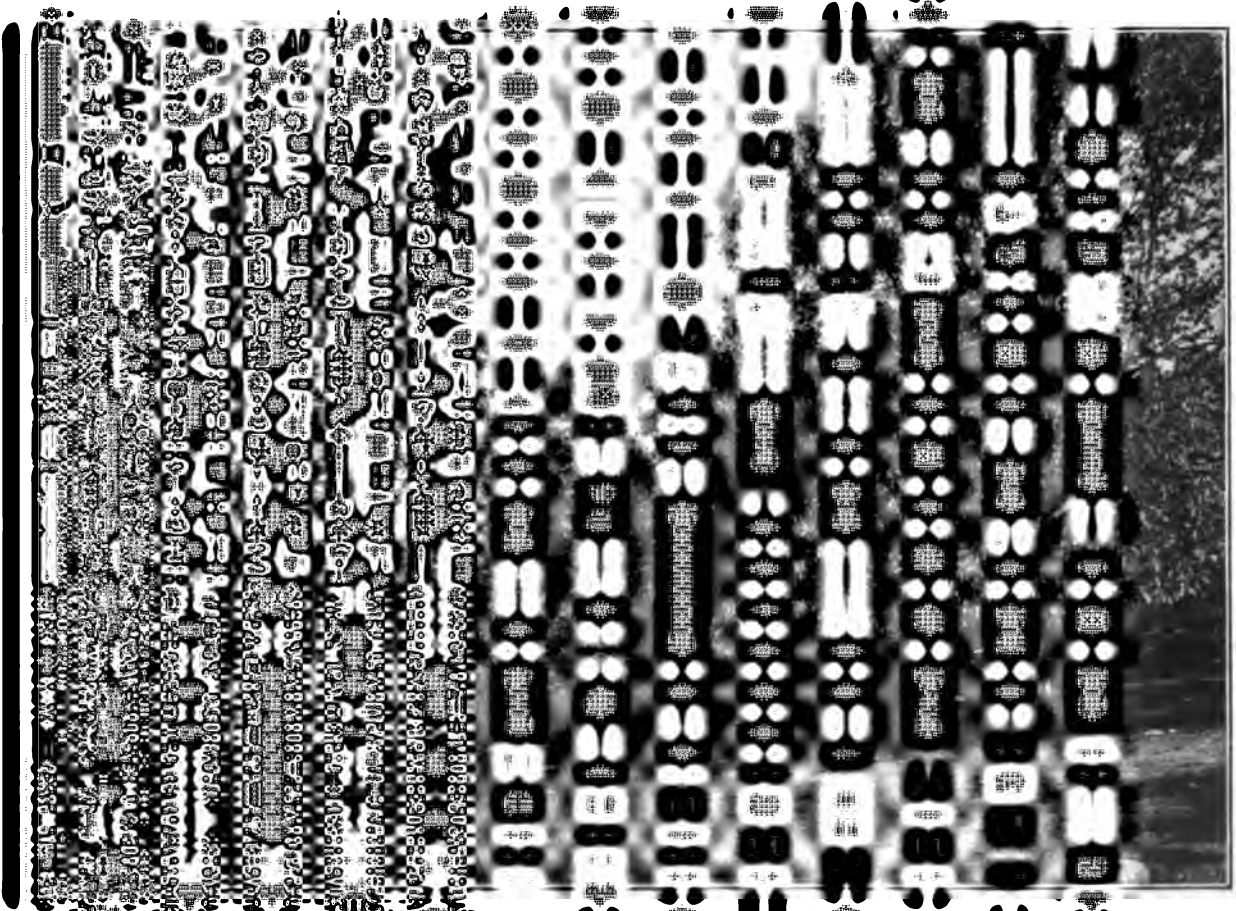


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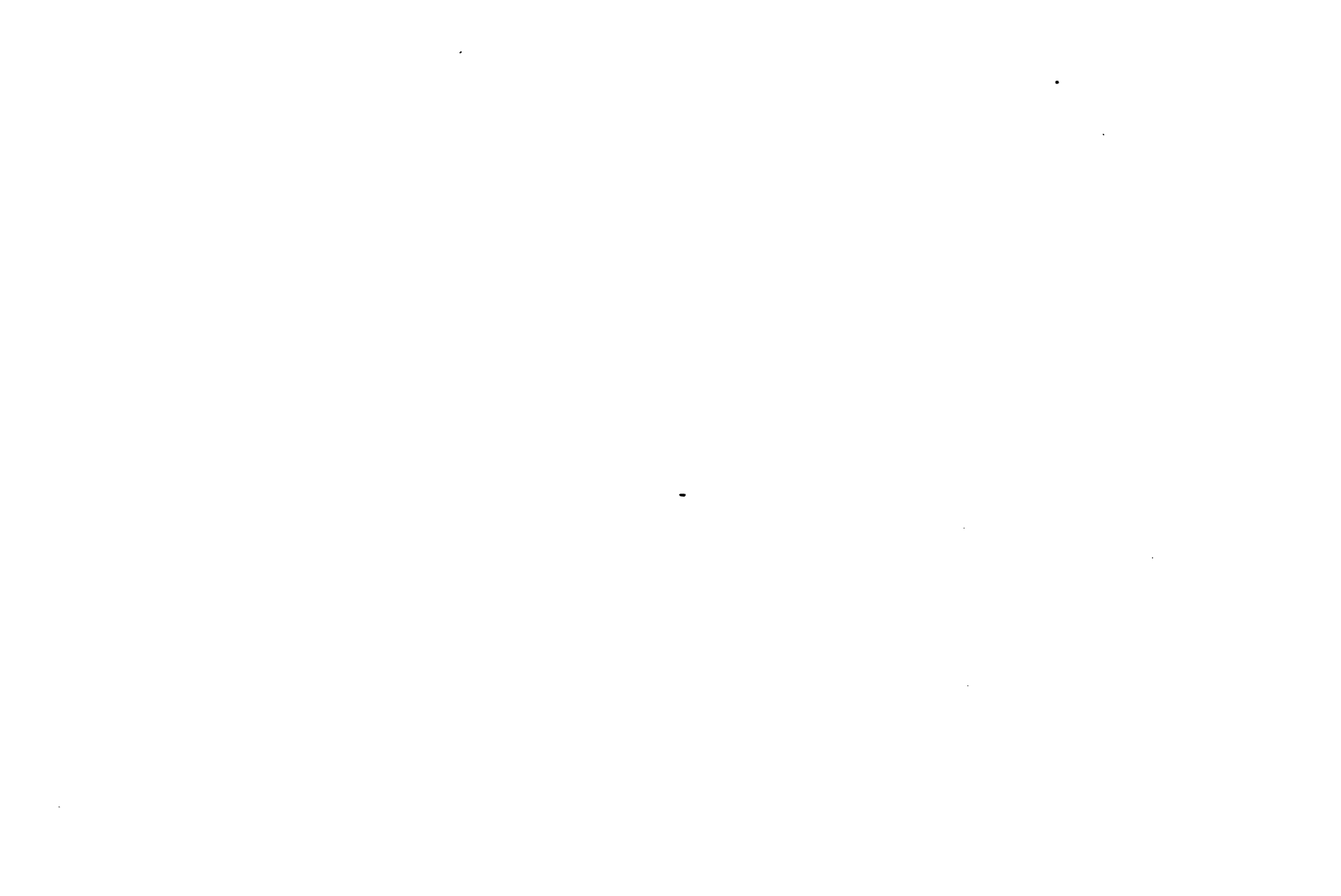




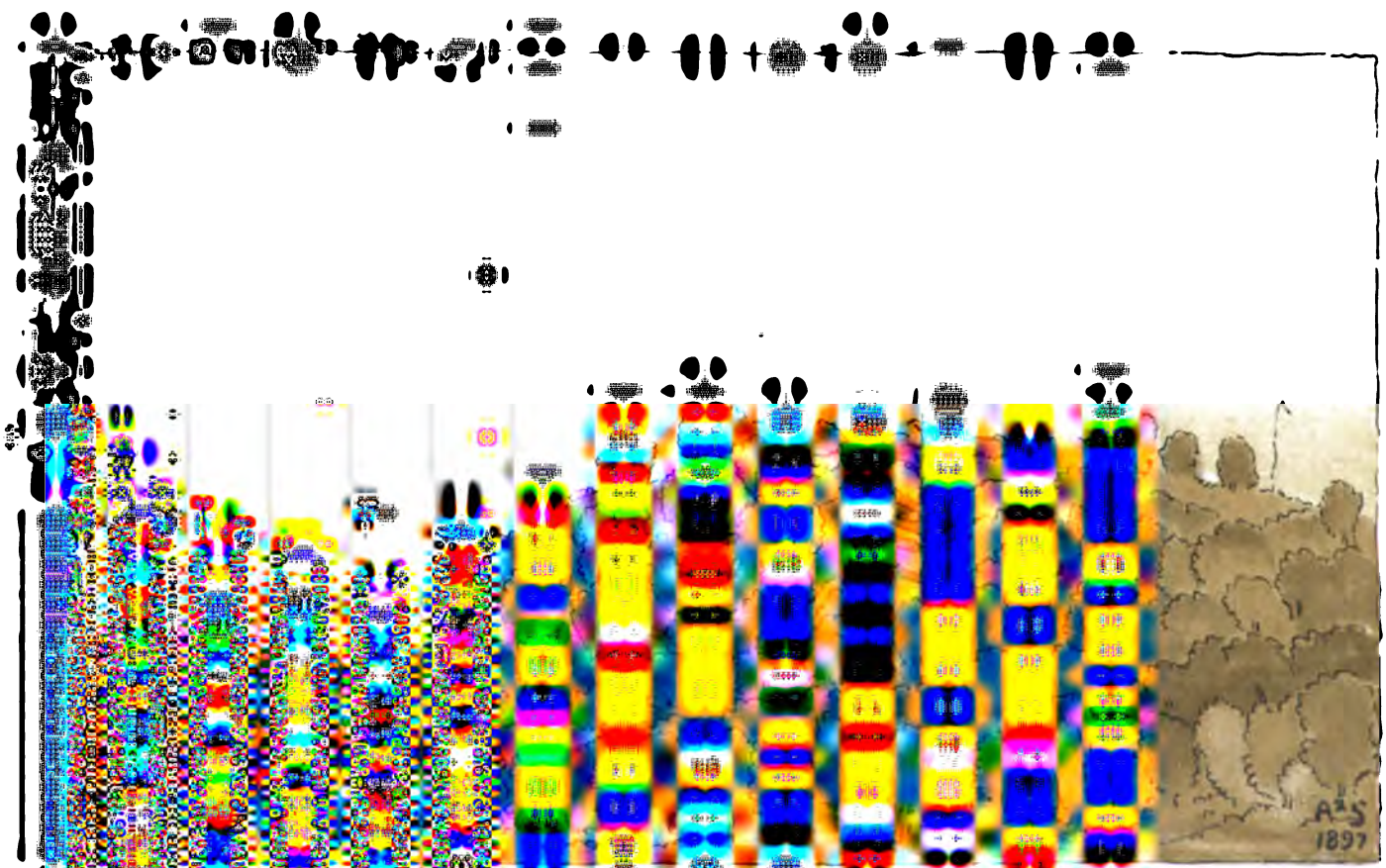
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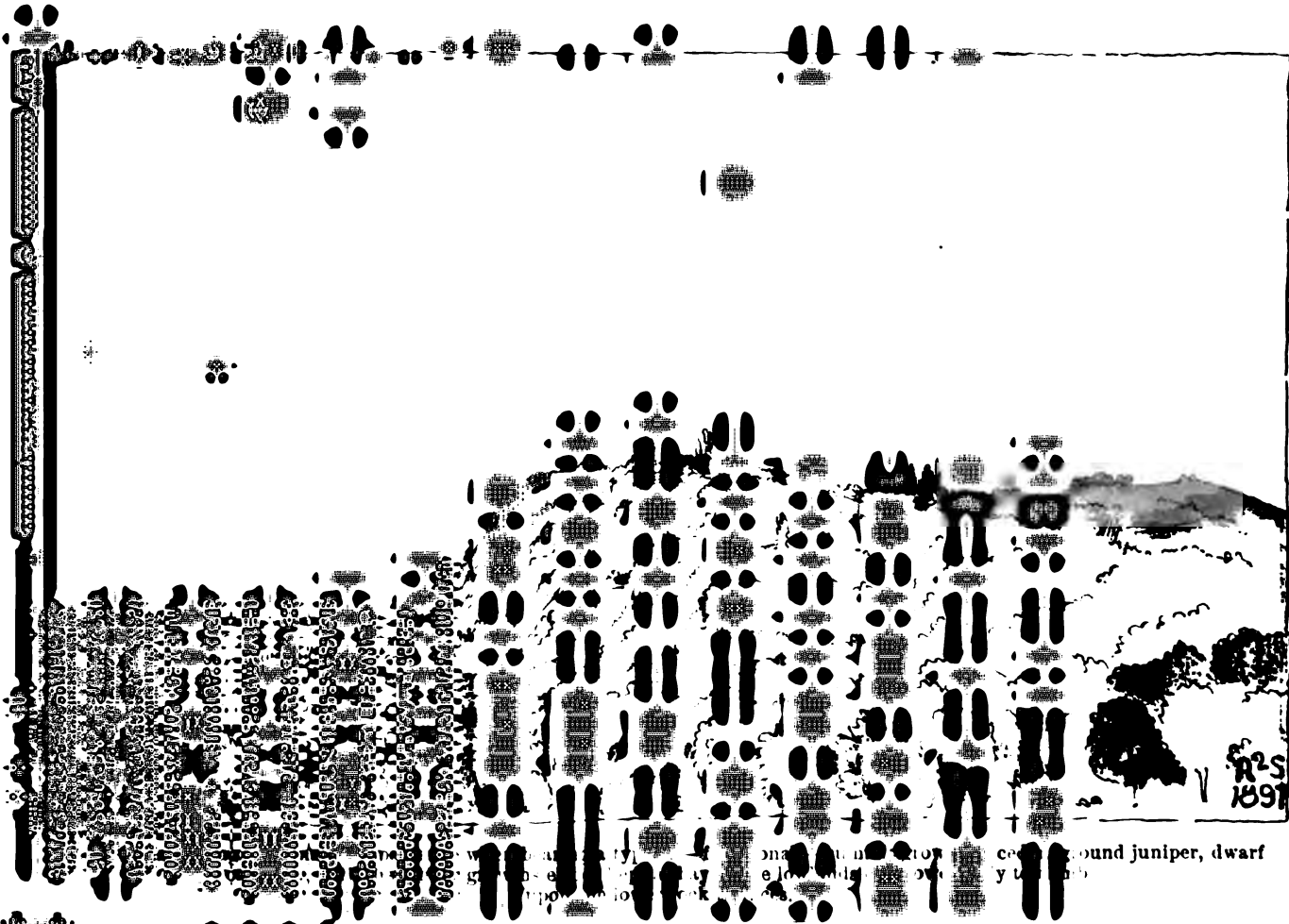




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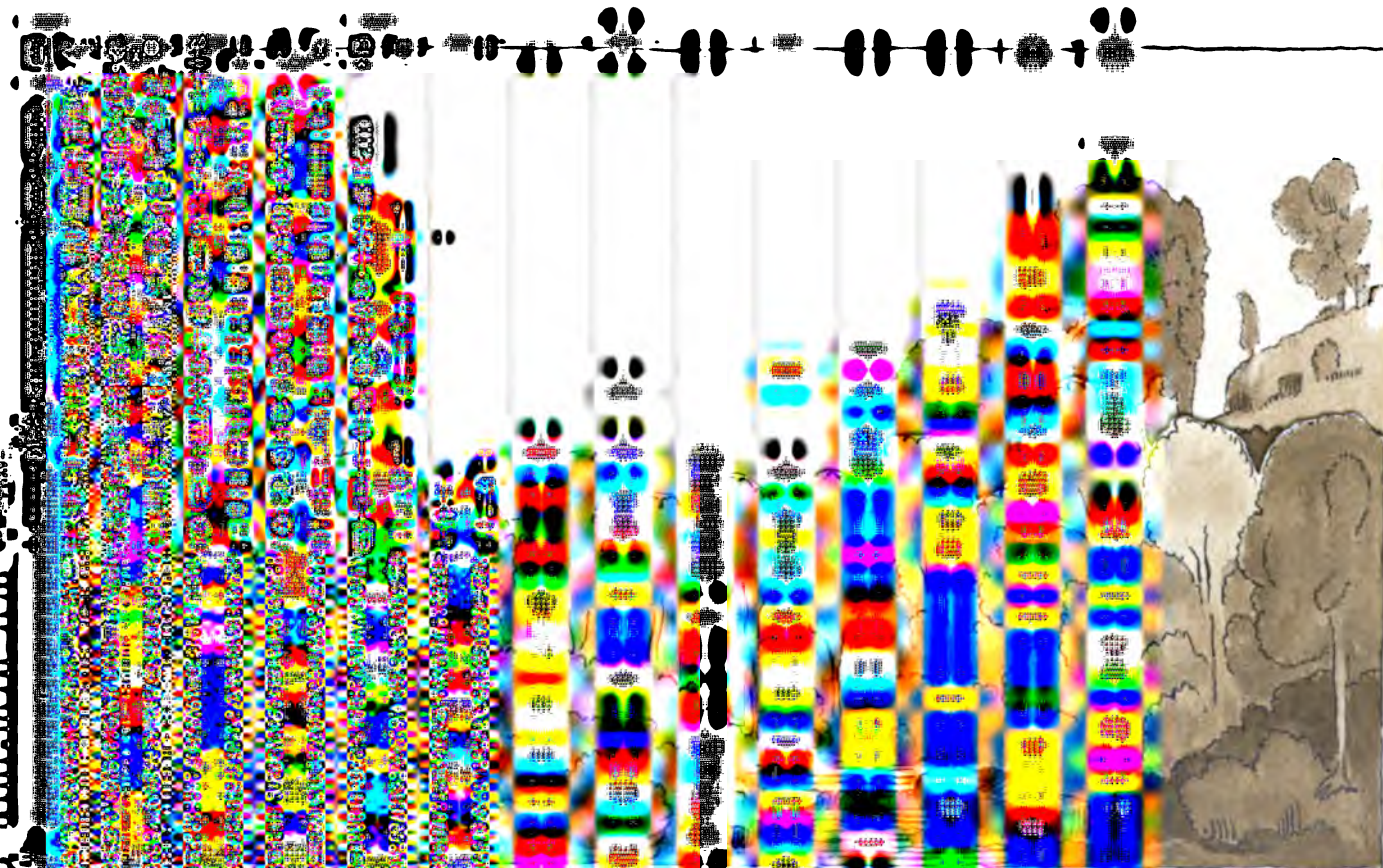
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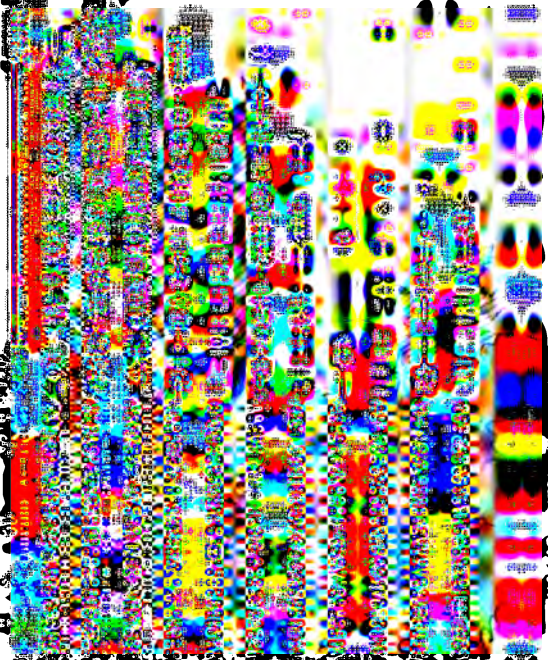
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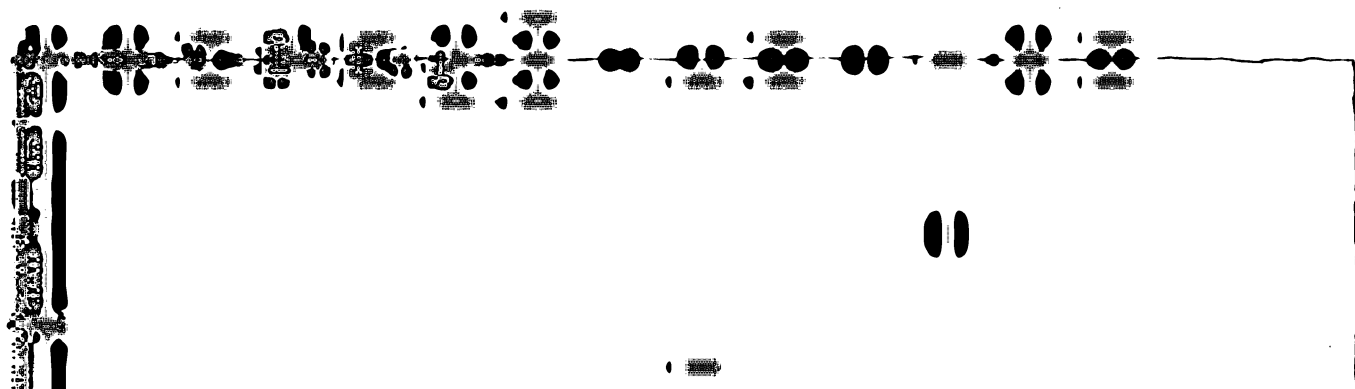




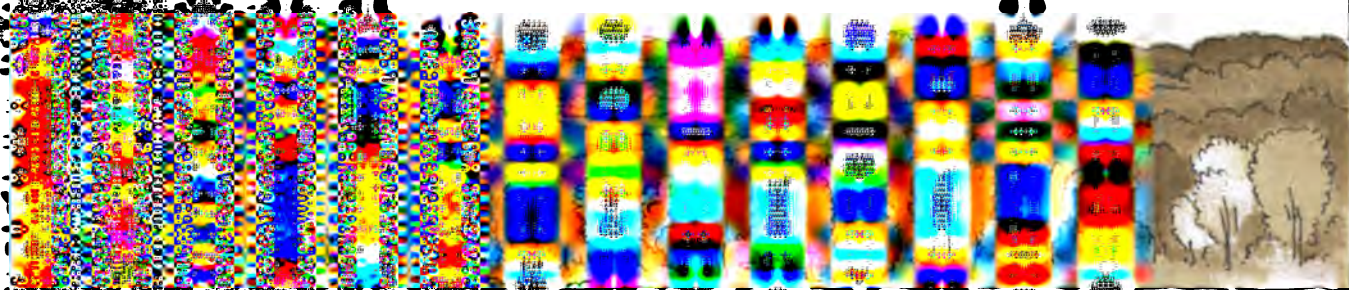
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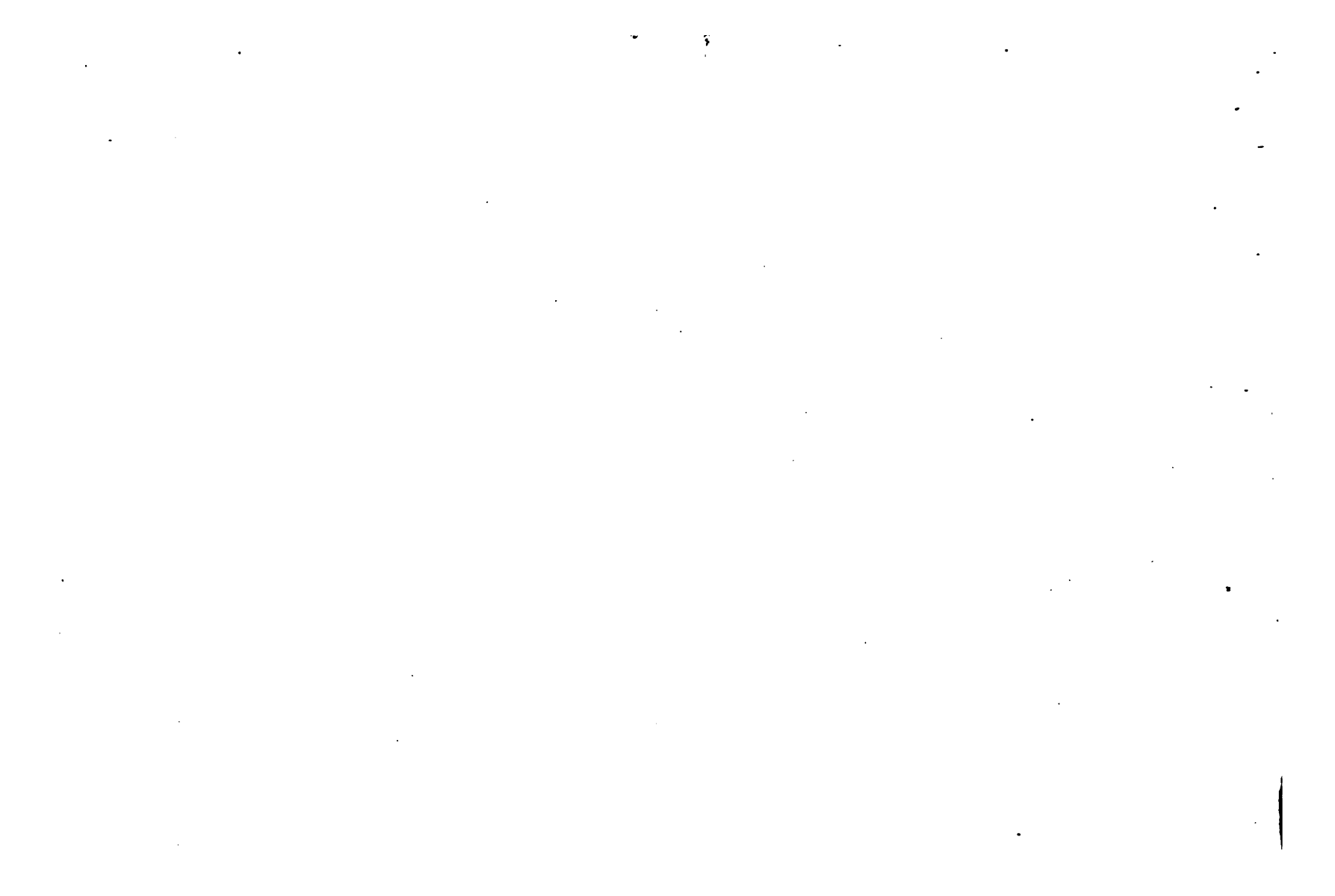








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